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1985-1986 Economic Handbook of the Machine Tool Industry

Compiled by the Statistical Department

National Machine Tool Builders' Association
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$ 35.00
(NMTBA Members $20.00)

FOREWORD

For the U.S. machine tool industry, 1984 was a year of significant recovery in orders and shipments from 1983's disastrous levels. But 1984 was also a disappointing year to many builders in that the recovery was much weaker than had been hoped for, especially against a backdrop of very strong general economic growth. Net new orders for the year totaled just over $2.9 billion, an improvement of 73 percent over 1983's very weak order level. However, this surge of orders still left the industry significantly short of the $4.8 billion order level registered in 1980, the last strong year for the industry. Shipments were also stronger but far from robust, growing 24 percent to stand at $2.4 billion for the year. This is still significantly short of the $3.6 billion registered as recently as 1982 and portends continued financial weakness for many U.S. machine tool builders. Indeed, as shown in Chapter 8, the industry reported negative profits for both 1983 and 1984.

The first six months of 1985 have proven similarly disappointing. Orders for the period totaled $1.4 billion, a level virtually identical to that for the same period last year. Shipments have moved ahead slightly, running at $1.1 billion for January through June, up 9 percent over their 1984 half-year total.

The current outlook for the rest of 1985 is troubling. With the economy's growth slowing and other macroeconomic indicators showing little or no positive momentum, the factors that could lead to a significant upswing for the machine tool industry during the remainder of 1985 are not in evidence. Instead, it appears that the industry will continue to fall victim to the forces that have kept it from enjoying a full recovery from recent recession-induced laws.

One of the most important of these has been the tremendous rise in the value of the U.S. dollar vis-a-vis foreign currencies. The high-valued dollar has radically curtailed exports of a wide variety of U.S.-built manufactured products since the foreign currency price of U.S. goods is now roughly double what it was just four years ago. Over this time span, machine tool exports have fallen from over $1.0 billion in 1981 to just $400 million for 1983 and 1984.

This decline of U.S. manufacturers' ability to export has had a major impact on the domestic economy. A variety of industries, many of them the traditional users of machine tools, have seen their domestic production volume shrink as their competitiveness in foreign markets has fallen. This has produced a decline in the demand for all of the myriad industrial commodities, components and types of equipment used by these industries and has led to a decline in U.S. demand for machine tools.

And just as the dollar made U.S.-produced goods noncompetitive overseas, it has also made imports of virtually all foreign products more competitive in the U.S. The tidal wave of bargain-priced imports that has swept the U.S. since 1981 has been a significant boon to consumers and helpful to many parts of the economy, but it has simultaneously crippled many domestic industries, machine tools among the foremost. The total volume of machine tool imports, after falling to less than $1 billion in 1983, surged to almost $1.4 billion in 1984. If current trends continue, the 1985 import total could exceed $1.7 billion.

Coincident with this rise in total imports is an increase in the import's share of domestic consumption. In 1980, just five years ago, the import share of consumption was 23 percent,

roughly twice the level of five years earlier. In 1984, the import share had risen to 38 percent. If early year trends continue, the import share for 1985 could exceed 45 percent. Clearly, the threat to the U.S. industry represented by imports continues unabated.

As we look beyond our current situation into the next decade and beyond, we feel that the machine tool industry will be called upon to play an even more vital role in America's industrial structure. Since the turn of the century, and especially in the post-World War II era, the United States has undergone a dramatic shift in its economy away from agriculture and manufacturing toward service industries. This has placed a responsibility on each farmer to produce more food to feed our expanding population and has placed an equivalent burden on each industrial employee to produce an ever larger volume of manufactured goods for each member of our society.

Just as mechanization was the answer to the problem of farm productivity, new and better capital equipment is the answer to the problem of industrial productivity. The machine tool industry looks forward to the technological challenge of obtaining more output from each manufacturing worker as it continues to provide its customers the world's most reliable, most productive machine tools.

The 17th edition of the Economic Handbook again offers industry executives, market researchers, legislators, administrators and students an expanded collection of data on the economy and the machine tool industry.

Wide fluctuations in currencies and varied definitions of different time periods account for occasional differences in the data for what appear to be identical subjects in the Handbook. As much as possible, these differences are explained in the chapter introductions, footnotes and the "Explanation of Terms" section at the end of the Handbook. Special explanatory notes for selected data series are also included. The NMTBA Statistical Department is also available to answer any questions concerning this publication. We are constantly trying to improve the value of this book. Your comments and suggestions for future editions are welcome.

James A. Gray
President

August 15, 1985

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TECHNICALLY SPEAKING...

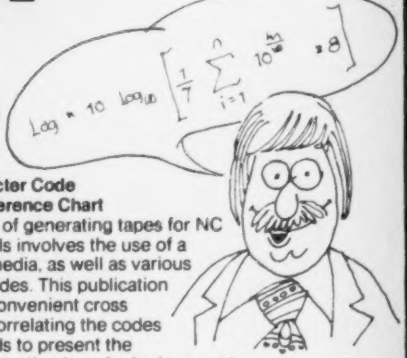
NMTBA offers a series of nine technical publications that contain suggestions, guidelines and information to make your company's operation more efficient and productive.

1 Guidelines for the Measurement of Machine Tool Utilization
This publication suggests a uniform procedure for the measurement and reporting of machine tool utilization. It provides a system to measure the effectiveness of a wide variety of machines and their related resources. It establishes indices of production, availability, utilization and consistent methods for their evaluation.

2 Noise Measurement Techniques
This publication suggests the most recent measuring techniques and procedures for the determination of machine tool sound. A discussion of time-weighted average sound levels is included, as well as a discussion of the disagreement between OSHA and EPA as to the basis for computing noise dosage.

3 Definition and Evaluation of Accuracy and Repeatability of NC Machine Tools
This publication was prepared to help develop a better understanding of the accuracy and repeatability of numerically controlled machine tools. Definitions, methods of computation and testing procedures are thoroughly discussed. This paper is recognized in the COCOM (Coordinating Committee) Regulations which govern the export licensing of NC machine tools.

4 Common Words As They Relate to NC Software
The aim of this publication is to improve communication among those involved with NC computer software. It defines the common terms used throughout the industry including those regarding the preparation and use of computer software for numerically controlled machine tools.


$Log = 10 \log_{10} \left[\frac{1}{7} \sum_{i=1}^{n} 10^{\frac{m}{10}} = 8 \right]$

5 NC Character Code Cross Reference Chart
The process of generating tapes for NC machine tools involves the use of a number of media, as well as various character codes. This publication provides a convenient cross reference, correlating the codes and standards to present the needed information in a single document.

6 Standards Index
A bibliography of standards pertinent to the design, manufacture, sale and use of machine tools.

7 Selecting an Appropriate NC Programming Method
Selecting the best NC programming method for a particular set of manufacturing circumstances is an important decision for new and established NC shops alike. The implications of this decision are manifold and an incorrect decision can adversely affect the expected return on high cost capital equipment. This publication explains the elements of manual and computer-aided programming and will help you in selecting the right method for your shop.

8 NC is EZ
This publication is intended as a practical and easy to understand NC primer. It will help prospective first-time NC users plan and execute the installation and start-up of new equipment with a minimum of difficulty.

9 NC Part Programming Profile and Summary Report
This survey and summary report provides data useful to companies to compare their own NC programming efforts with other shops having a similar number of NC machines. It puts in proper perspective the NC programming effort required at shops considering acquisitions – perhaps first-time – of machine tools.

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1

NATIONAL ECONOMY AND MACHINE TOOLS

Man is a tool-making animal. Since the beginning of history man has used his tools to make even better tools. The culmination of these efforts are today's modern machine tools. These are the machines that form the basis of much of our modern civilization.

A machine tool is a power-driven machine, not hand held, that is used to cut, form, or shape metal. Few, if any, products and services of an industrialized country would exist were it not for machine tools. There would be no trains, no ships, no planes, no cars. There would be no power plants, no electric lights, no refrigerators, or other electrical appliances. And, without agricultural machines, without modern transportation, and without refrigeration—all dependent on modern machine tools—there would be no way to feed the more than 220 million people in this country.

Yet, such is the efficiency and longevity of the products of the machine tool industry that its present production has always represented only a small part of the nation's total output. The entire U.S. machine tool industry is smaller than many individual corporations. Even the limited data available for the first years of this century show, for instance, that metalcutting machine tools shipments made up only slightly more than 10 cents of every $100 in goods and services produced. In 1984, shipments of complete machine tools made up just over 6 cents of every $100 of Gross National Product.

Comparisons of machine tool consumption with capital expenditures by durable goods manufacturing industries show that machine tools make up a comparatively small but significant part of total expenditures for plant, machinery, and other equipment.

Machine tools are typically installed as capital equipment in metalworking industries. The data on machine tools installed in U.S. plants (see Chapter 9) and data collected by NMTBA indicate that the major users of machine tools are the metalworking industries: fabricated metal products, machinery, and transportation equipment (among the latter, primarily the automobile and aerospace industries). Thus, this chapter focuses on private investment, on expenditures for new plant and equipment, and on the orders and shipments of the metalworking industries. Business activity in these industries is likely to affect their capital expenditures and, in turn, to affect the orders that flow to the machine tool industry. However, many other factors also seem to affect the ordering of new machine tools.

The machine tool industry is highly sensitive to the treatment of corporate capital consumption allowances such as investment tax credits and depreciation. Changes in these affect the willingness and ability of the industry's customers to make machine tool purchases. The work of many students of the machine tool industry has indicated that corporate profitability, financial conditions, and the general level of business confidence are also important determinants of machine tool order activity.

Capacity utilization is recognized as another significant determinant of future business investment in plant equipment and thus in machine tools. While attempts to measure the utilization in a broad spectrum of industries are fairly recent, there are several existing series on capacity utilization in manufacturing. In this issue, three of the available measures are presented. Also included is a capacity utilization series for selected machine tool consuming industries as published by the McGraw-Hill Publications Company.

Currently, there is much concern in the United States about the erosion of our capital stock. For instance, studies have shown that the average age of the machine tool population in this country has gone up significantly since the 1950s. Investment apparently has not kept up with the need to replace aging capital assets in U.S. metalworking industries. Several tables showing the stock of capital assets in various machine tool consuming industries are in this chapter. Of particular interest are the tables relating purchases and depreciation of capital goods in manufacturing industries, and the tables of business capital appropriations in current and constant dollars.

Many figures shown in this chapter are in current dollars . . . dollars not adjusted for changes in purchasing power. Overall changes in the purchasing power of the dollar, as measured by producer or consumer prices indexes, provide a measure of the erosion of its value. To measure the impact of price increases, several indexes and "price deflators" to generate "constant dollar" figures are available. These include indexes of producer prices for metal cutting and metal forming machine tools. However, because these indexes are limited in their ability to make adjustments for changes in the qualitative characteristics of machine tools, they should be used with caution.

U.S. machine tool builders have traditionally been active exporters of their products. Until 1978, the U.S. machine tool balance of trade had continuously been positive and had helped offset trade deficits incurred in other sectors. However, a surge in imports in the late 1970's, sparked by unprecedented peacetime machine tool demand, led to the development of a sizable balance of trade deficit. What is troubling is that the competitive impact of machine tool imports is understated in current statistics. The value data for imports exclude important cost elements such as insurance and ocean freight which also affect the balance of payments. These shortcomings of the foreign trade statistics are discussed in Chapter 5, as are other detailed aspects of machine tool foreign trade.

To protect and expand foreign markets many U.S. businesses have established plants in foreign countries. Direct foreign investment increased rapidly during the

1960's and 1970's and U.S. machine tool builders joined this move. While no information is available on machine tool direct foreign investment, data are presented for U.S. direct foreign investments in various countries by all industries and by manufacturing industries.

Definitions and discussions of the terms used in this and other chapters are in the glossary at the end of this book.

THE NATIONAL ECONOMY AND MACHINE TOOLS
1958 to Date

		Shipments in Billion Dollars			Shipments in Million Dollars		
Year	GNP Billion $	All Manufacturing Industries	Durable Goods Industry	Nonelectrical Machinery Industry	Machine Tool Industry	Machine Tool Products	Complete Machine Tools
1958	$ 449.7	$ 327.0	$ 162.8	$ 23.4	$ 998	$ 870	$ 591
1959	487.9	363.4	187.3	26.6	1,112	975	616
1960	506.5	370.5	190.6	26.8	1,266	1,126	744
1961	524.6	371.1	187.4	26.6	1,242	1,102	751
1962	565.0	400.3	207.1	29.2	1,430	1,223	821
1963	596.7	420.7	219.4	31.0	1,502	1,370	896
1964	637.7	448.0	235.6	35.3	1,791	1,650	1,164
1965	691.1	491.9	266.7	39.5	2,107	1,955	1,426
1966	756.0	538.4	295.8	46.9	2,554	2,319	1,685
1967	799.6	557.8	303.2	49.2	2,841	2,585	1,806
1968	873.4	603.2	332.4	51.0	2,817	2,500	1,727
1969	944.0	642.5	353.7	56.1	2,835	2,507	1,598
1970	992.7	634.0	338.6	56.5	2,598	2,278	1,443
1971	1,077.6	671.1	359.7	56.0	2,019	1,698	998
1972	1,185.9	756.3	408.3	65.8	2,112	1,929	1,019
1973	1,326.4	875.2	476.2	77.8	2,777	2,596	1,501
1974	1,434.2	1,017.5	530.7	92.5	3,580	3,189	2,031
1975	1,549.2	1,039.1	523.9	95.8	3,834	3,432	2,452
1976	1,718.0	1,185.6	608.3	105.5	3,567	3,197	2,060
1977	1,918.3	1,358.4	711.2	122.2	3,943	3,675	2,281
1978	2,163.9	1,522.9	814.2	143.2	4,978	4,735	3,013
1979	2,417.8	1,727.2	912.7	166.5	6,053	5,762	3,877
1980	2,631.7	1,852.7	930.6	180.7	6,981	6,702	4,692
1981(r)	2,957.8	2,017.5	1,006.5	201.5	7,481	7,206	5,096
1982(r)	3,069.3	1,908.3	920.3	180.6	5,869	5,539	3,604
1983(r)	3,304.8	2,045.3	1,019.4	178.3	NA	NA	1,845
1984(p)	3,662.8	2,274.9	1,182.0	210.2	NA	NA	2,286

NA - Not Available. p - Preliminary. r - Revised.

Sources: Col. 1: U.S. Department of Commerce, "Business Statistics, 1979" and "Survey of Current Business" (monthly). Cols. 2, 3 and 4: U.S. Bureau of the Census. "Manufacturers' Shipments, Inventories and Orders: 1978-1984" (revised) and Series M3-1 (monthly). Cols. 5 and 6: U.S. Bureau of the Census, "Annual Survey of Manufactures," M (AS)-1 & 2 and 1982 "Census of Manufactures". Col. 7: National Machine Tool Builders' Association, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

The last three columns cover the following three different entities.

Machine Tool Industry: (Standard Industrial Classifications 3541 and 3542). All shipments orginating in establishments whose primary products are machine tools. The figures include other-than-machine tools produced in these establishments as well as miscellaneous receipts.

Machine Tool Products: All machine tool products shipped by the machine tool industry and by other industries. Excludes all shipments of items which are not classified as machine tool products.

Complete Machine Tools: Shipments of complete machine tools, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines, as reported by NMTBA.

THE NATIONAL ECONOMY AND MACHINE TOOLS

Indexes, 1958 to Date

1967 = 100

Year	GNP	All Manufacturing Industries	Durable Goods Industry	Nonelectric Machinery Industry	Machine Tool Industry (a)	Machine Tool Products (a)	Complete Machine Tools (a)
1958	56.2	58.6	53.7	47.6	35.1	33.7	32.7
1959	61.0	65.1	61.8	54.1	39.1	37.7	34.1
1960	63.3	66.4	62.9	54.5	44.6	43.6	41.2
1961	65.6	66.5	61.8	54.1	43.7	42.6	41.6
1962	70.7	71.8	68.3	59.3	50.3	47.3	45.5
1963	74.6	75.4	72.4	63.0	52.9	53.0	49.6
1964	79.8	80.3	77.7	71.7	63.0	63.8	64.5
1965	86.4	88.2	88.0	80.3	74.2	75.6	79.0
1966	94.5	96.5	97.6	95.3	89.9	89.7	93.3
1967	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1968	109.2	108.1	109.6	103.7	99.2	96.7	95.6
1969	118.1	115.2	116.7	114.0	99.8	97.0	88.5
1970	124.1	113.7	111.7	114.8	91.4	88.1	79.9
1971	134.8	120.3	118.6	113.8	71.1	65.7	55.3
1972	148.3	135.6	134.7	133.7	74.3	74.6	56.4
1973	165.9	156.9	157.1	158.1	97.7	100.4	83.1
1974	179.4	182.4	175.0	188.0	126.0	123.4	112.5
1975	193.7	186.3	172.8	194.7	135.0	132.8	135.8
1976	214.9	212.5	200.6	214.4	125.6	123.7	114.1
1977	239.9	243.5	234.6	248.4	138.8	142.2	126.3
1978	270.6	273.0	268.5	291.1	175.2	183.2	166.8
1979	302.4	309.6	301.0	338.4	213.1	227.9	214.7
1980	329.3	332.1	306.9	367.5	245.7	259.3	259.8
1981(r)	369.9	361.7	332.0	409.6	263.3	278.8	282.2
1982(r)	383.9	342.1	303.5	367.1	208.3	214.3	199.6
1983(r)	413.3	366.7	336.2	362.4	NA	NA	102.2
1984(p)	458.1	407.8	389.8	427.2	NA	NA	126.6

NA - Not Available.   p - Preliminary.   r - Revised.

(a) See notes on page 4.

Sources: U.S. Department of Commerce, U.S. Bureau of the Census, and NMTBA.

GROSS NATIONAL PRODUCT AND COMPONENTS
1962 to Date

Year	Gross National Product	Personal Consumption Expenditures	Gross Private Domestic Investment	Net Exports of Goods and Services	Government Purchases of Goods and Services
In current dollars (billions)					
1962	$ 565.0	$ 355.2	$ 85.4	$ 6.4	$118.0
1963	596.7	374.6	90.9	7.6	123.7
1964	637.7	400.5	97.4	10.1	129.8
1965	691.1	430.4	113.5	8.8	138.4
1966	756.0	465.1	125.7	6.5	158.7
1967	799.6	490.3	122.8	6.3	180.2
1968	873.4	536.9	133.3	4.3	199.0
1969	994.0	581.8	149.3	4.2	208.8
1970	992.7	621.7	144.2	6.7	220.1
1971	1,077.6	672.2	166.4	4.1	234.9
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,326.4	812.0	229.8	14.2	270.4
1974	1,434.2	888.1	228.7	13.4	304.1
1975	1,549.2	976.4	206.1	26.8	339.9
1976	1,718.0	1,084.3	257.9	13.8	362.1
1977	1,918.3	1,204.4	324.1	−4.0	393.8
1978	2,163.9	1,346.5	386.6	−1.1	431.9
1979	2,417.8	1,507.2	423.0	13.2	474.4
1980	2,631.7	1,668.1	401.9	23.9	537.8
1981(r)	2,957.8	1,849.1	484.2	28.0	596.5
1982(r)	3,069.3	1,984.9	414.9	19.0	650.5
1983(r)	3,304.8	2,155.9	471.6	−8.3	685.5
1984	3,662.8	2,341.8	637.8	−64.2	747.4
In constant 1972 dollars (billions)					
1962	$ 800.3	$ 482.0	$117.6	$ 7.5	$193.2
1963	832.5	500.5	125.1	9.4	197.6
1964	876.4	528.0	133.0	12.8	202.6
1965	929.3	557.5	151.9	10.1	209.8
1966	984.8	585.7	163.0	6.5	229.7
1967	1,011.4	602.7	154.9	5.4	248.5
1968	1,058.1	634.4	161.6	1.9	260.2
1969	1,087.6	657.9	171.4	0.9	257.4
1970	1,085.6	672.1	158.5	3.9	251.1
1971	1,122.4	696.8	173.9	1.6	250.1
1972	1,185.9	737.1	195.0	0.7	253.1
1973	1,255.0	768.5	217.5	15.5	253.5
1974	1,248.0	763.6	195.5	27.8	261.2
1975	1,233.9	780.2	154.8	32.2	266.7
1976	1,298.2	823.1	184.5	25.4	265.2
1977	1,369.7	864.3	214.2	22.0	269.2
1978	1,438.6	903.2	236.7	24.0	274.6
1979	1,479.4	927.6	236.3	37.2	278.3
1980	1,475.0	931.8	208.5	50.3	284.3
1981(r)	1,512.2	950.5	230.9	43.8	287.0
1982(r)	1,480.0	963.3	194.3	29.7	292.7
1983(r)	1,534.7	1,009.2	221.0	12.6	291.9
1984	1,639.3	1,062.4	289.9	−15.0	302.1

r - Revised.

Note: Individual components may not add to total GNP due to rounding.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

ACTUAL AND PROJECTED GNP AND OTHER ECONOMIC INDICATORS

	Measure	Actual 1981(r)	Actual 1982(r)	Actual 1983(r)	Projection 1984
Gross National Product	Bil. $	$3,069.3	$3,304.8	$3,662.8	$3,933.0
GNP in Constant Dollars	Bil. 1972 $	1,485.4	1,534.7	1,639.3	1,702.0
GNP Implicit Price Deflator	1972 = 100	206.9	215.6	223.4	231.1
Industrial Production	1967 = 100	138.6	147.6	163.5	170.0
Unemployment Rate	Percent	9.7%	9.6%	7.5%	7.0%
Corporate Profits After Taxes	Bil. $	$ 115.1	$ 127.4	$ 145.9	$ 153.0
Non-Residential Fixed Investment	Bil. 1972 $	166.1	171.0	204.9	224.0
Change in Business Inventories	Bil. 1972 $	-9.4	-3.6	24.8	15.3
Personal Consumption Expenditures	Bil. 1972 $	970.2	1,009.0	1,062.0	1,104.0
Federal Government Purchases	Bil. 1972 $	116.6	116.2	122.5	132.0

r - Revised.

Sources: Actual: U.S. Department of Commerce, "Survey of Current Business" (monthly). Projected: American Statistical Association and National Bureau of Economic Research panel of forecasters, "Economic Outlook USA, Spring 1985."

SELECTED PRICE DEFLATORS
1965 to Date

Year	Price Deflators: Gross National Product	Price Deflators: Personal Consumption Expenditure	Price Deflators: Producers' Durable Equipment	Price Deflators: Metal-Working Machinery & Equipment
	1972 = 100			
1965	74.4	77.2	80.6	76.3
1966	76.8	79.4	82.1	79.8
1967	79.1	81.4	84.3	83.2
1968	82.5	84.6	87.2	86.5
1969	86.8	88.4	89.9	89.7
1970	91.4	92.5	93.2	94.8
1971	96.0	96.5	97.2	97.6
1972	100.0	100.0	100.0	100.0
1973	105.7	105.7	101.8	104.4
1974	114.9	116.2	109.3	122.2
1975	125.6	125.2	126.2	142.8
1976	132.3	131.7	133.9	152.0
1977	140.1	139.3	141.0	165.1
1978	150.4	149.1	149.7	180.5
1979	163.4	162.5	158.8	200.7
1980	178.4	179.0	169.1	228.3
1981	195.6	194.5	179.4	250.7
1982	207.4	206.0	182.8	267.0
1983(r)	215.3	213.6	183.3	271.6
1984	223.4	220.4	186.0	277.8

r - Revised.

Note: Gross National Product, Personal Consumption Expenditures and Producers' Durable Equipment values are "Implicit Price Deflators;" Metal-Working Machinery and Equipment values are "Producer Price Indices."

Source: U.S. Department of Commerce, "Business Statistics," 1979, "Survey of Current Business" (monthly). U.S. Department of Labor, Bureau of Labor Statistics.

Price deflators are used to express changes over a period of time in constant dollars. The implicit price deflator for GNP is a weighted average of the price indexes used to deflate the components of GNP. It is generally regarded as the best single measure of broad price movements in the economy as a whole.

GROSS NATIONAL PRODUCT AND GOVERNMENT RECEIPTS
Selected Years, 1938 to Date
(Values in Billions of Dollars)

Year	GNP	Total Gov't Receipts	Percent of GNP	Federal Federal Gov't Receipts	Percent of GNP	State & Local Gov't Receipts	Percent of GNP
1938	$ 85.0	$ 15.0	17.7%	$ 6.5	7.7%	$ 9.3	10.9%
1945	212.4	53.2	25.1	42.5	20.0	11.6	5.5
1950	286.5	69.0	24.1	50.0	17.5	21.3	7.4
1955	400.0	101.1	25.3	72.6	18.2	31.7	7.9
1960	506.[illegible]	139.5	27.5	96.1	19.0	49.9	9.9
1965	691.1	188.3	27.3	124.3	18.0	75.1	10.9
1970	992.7	302.8	30.5	191.9	19.3	135.4	13.6
1974	1,434.2	455.2	31.7	287.8	20.1	211.4	14.7
1975	1,549.2	470.5	30.1	287.3	18.5	237.7	15.3
1976	1,718.0	538.4	31.3	331.8	19.3	267.8	15.6
1977	1,918.3	605.4	31.6	375.2	19.6	297.7	15.5
1978	2,163.9	681.9	31.5	431.6	19.9	327.6	15.1
1979	2,417.8	765.1	31.6	493.6	20.4	352.0	14.6
1980	2,631.7	838.3	31.9	540.9	20.6	386.1	14.7
1981(r)	2,957.8	956.9	32.4	624.8	21.1	420.0	14.2
1982(r)	3,069.3	974.8	31.8	616.7	20.1	441.9	14.4
1983(r)	3,304.8	1,033.0	31.3	641.1	19.4	478.2	14.5
1984(p)	3,662.8	1,133.8	31.0	703.5	19.2	523.2	14.3

p - Preliminary.   r - Revised.

Note: Federal grants-in-aid to State and local governments are reflected in State and local receipts. Total government receipts have been adjusted to eliminate this duplication.

Source: "Economic Report of the President," February, 1985, and earlier editions. U.S. Department of Commerce, "Survey of Current Business" (monthly).

CORPORATE PROFITS AND TAX
Selected Years, 1938 to Date
(Billions of Dollars)

Year	Corporate Profits Before Taxes	Profits Tax Liability	Profits After Tax	Net Dividend Payments	Undistributed Profits
1938	$ 4.0	$ 1.0	$ 2.9	$ 3.2	$ 0.2
1945	19.7	10.7	9.0	4.6	4.4
1950	42.6	17.9	24.7	8.8	15.9
1955	48.4	22.0	26.4	10.3	16.1
1960	48.5	22.7	25.8	12.9	13.0
1965	75.2	30.9	44.3	19.1	25.2
1970	71.5	34.5	37.0	22.9	14.1
1974	126.9	52.4	74.5	31.0	43.6
1975	120.4	49.8	70.6	31.9	38.7
1976	152.0	63.8	88.2	29.1	59.1
1977	179.6	72.7	106.9	30.5	76.4
1978	209.4	83.2	126.2	36.5	89.7
1979	222.1	87.6	134.5	37.6	96.9
1980	204.7	84.8	119.9	40.4	79.5
1981(r)	196.8	81.1	115.6	52.0	63.7
1982(r)	143.1	60.7	82.5	56.7	25.8
1983(r)	178.4	75.8	102.6	63.0	39.6
1984(p)	213.2	90.0	123.2	71.6	51.6

p - Preliminary.   r - Revised.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

THE FEDERAL BUDGET
Fiscal Years, 1930 to Date
(Billions of Dollars)

Year	Receipts	Outlay	Surplus or Deficit (−)	Year	Receipts	Outlay	Surplus or Deficit (−)
1930	$ 4.1	$ 3.3	$ 0.7	1960	$ 92.5	$ 92.2	$ 0.3
1931	3.1	3.6	−0.5	1961	94.4	97.8	−3.4
1932	1.9	4.7	−2.7	1962	99.7	106.8	−7.1
1933	2.0	4.6	−2.6	1963	106.6	111.3	−4.8
1934	3.0	6.6	−3.6	1964	112.7	118.6	−5.9
1935	3.7	6.5	−2.8	1965	116.8	118.4	−1.6
1936	4.0	8.4	−4.4	1966	130.9	134.7	−3.8
1937	5.0	7.7	−2.8	1967	148.9	157.6	−8.7
1938	5.6	6.8	−1.2	1968	153.0	178.1	−25.2
1939	5.0	8.8	−3.9	1969	186.9	183.6	3.2
1940	6.4	9.5	−3.1	1970	192.8	195.7	−2.8
1941	8.6	13.6	−5.0	1971	187.1	210.2	−23.0
1942	14.4	35.1	−20.8	1972	207.3	230.7	23.4
1943	23.6	78.5	−54.9	1973	230.8	245.6	−14.8
1944	44.3	91.3	−47.0	1974	263.2	267.9	−4.7
1945	45.2	92.7	−47.5	1975	279.1	324.2	−45.2
1946	39.3	55.2	−15.9	1976	298.1	364.5	−66.4
1947	38.4	34.5	3.9	Tr. Qtr.	81.2	94.2	−13.0
1948	41.8	29.8	12.0	1977	355.6	400.5	−44.9
1949	39.4	38.8	0.6	1978	399.6	448.4	−48.8
1950	39.5	42.6	−3.1	1979	463.3	491.0	−27.7
1951	51.6	45.5	6.1	1980	517.1	576.7	−59.6
1952	66.2	67.7	−1.5	1981	599.3	657.2	−57.9
1953	69.6	76.1	−6.5	1982	617.8	728.4	−110.6
1954	69.7	70.9	−1.2	1983	600.6	796.0	195.4
1955	65.5	68.5	−3.0	1984(r)	666.5	841.8	−175.4
1956	74.5	70.5	4.1	1985E	736.9	946.6	−209.8
1957	80.0	76.7	3.2	1986E	793.7	972.2	−178.5
1958	79.6	82.6	−2.9				
1959	79.2	92.1	−12.9				

E - Estimate. r - Revised.

Tr. Qtr.—Transition Quarter: Beginning with the 1977 Federal Budget, the fiscal year runs from October 1 through September 30. To facilitate the conversion, a three-month transition period was provided between fiscal years 1976 and 1977.

Note: 1930 to 1939: Administrative Budget: 1940 to 1953: Consolidated Cash Statement: 1954 to Date: Unified Budget.

Source: "Economic Report of the President," February 1985 and earlier editions.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT

1959 to Date

(Values in Billions of Current Dollars)

Year	Gross National Product Billion $	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
		Billion $	% of GNP	Billion $	% of GNP
1959	$ 487.9	$ 45.9	9.4%	$ 28.3	5.8%
1960	506.5	48.5	9.6	29.7	5.9
1961	524.6	48.0	9.1	28.9	5.5
1962	565.0	52.2	9.2	32.1	5.7
1963	596.7	54.8	9.2	34.4	5.8
1964	637.7	61.0	9.6	38.7	6.1
1965	691.1	72.7	10.5	45.8	6.6
1966	756.0	83.1	11.0	53.0	7.0
1967	799.6	83.9	10.5	53.7	6.7
1968	873.4	90.6	10.4	58.2	6.7
1969	994.0	101.3	10.2	64.6	6.5
1970	992.7	103.9	10.5	65.1	6.6
1971	1,077.6	107.9	10.0	67.4	6.3
1972	1,185.9	121.0	10.2	76.8	6.5
1973	1,326.4	143.3	10.8	92.3	7.0
1974	1,434.2	156.6	10.9	100.6	7.0
1975	1,549.2	157.7	10.2	102.3	6.6
1976	1,718.0	174.1	10.1	115.2	6.7
1977	1,918.3	205.2	10.7	140.8	7.3
1978	2,163.9	248.9	11.5	170.2	7.9
1979	2,417.8	290.2	12.0	191.9	7.9
1980	2,631.7	308.8	11.7	197.9	7.5
1981(r)	2,957.8	353.9	12.0	218.6	7.4
1982(r)	3,069.3	349.6	11.4	207.5	6.8
1983(r)	3,304.8	352.9	10.7	223.2	6.8
1984(p)	3,662.8	425.7	11.6	275.3	7.5

p - Preliminary. r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business" (monthly).

Gross private fixed nonresidential domestic investment includes capital expenditures by the domestic business sector for (1) new and replacement construction (e.g., buildings, stores, and warehouses) and (2) producers' durable equipment. Expenditures for producers' durable equipment include the new and replacement purchases of a automobiles, trucks, various types of machinery, and other equipment used by the private sector in the production of goods and services.

GROSS NATIONAL PRODUCT AND PRIVATE INVESTMENT IN CONSTANT DOLLARS
1948 to Date
(Values in Billions of 1972 Dollars)

	Gross National Product	Gross Private Fixed Nonresidential Domestic Investment			
		Total		Producers' Durable Equipment	
Year	Billion $	Billion $	% of GNP	Billion $	% of GNP
1948	$ 489.8	$ 51.1	10.4%	$ 32.6	6.6%
1949	492.2	46.0	9.3	28.1	5.7
1950	534.8	50.0	9.3	30.8	5.8
1951	579.4	52.9	9.1	32.2	5.6
1952	600.8	52.1	8.7	31.5	5.2
1953	623.6	56.3	9.0	33.7	5.4
1954	616.1	55.4	9.0	31.8	5.2
1955	657.5	61.3	9.3	35.9	5.5
1956	671.6	65.4	9.7	37.0	5.5
1957	683.8	66.2	9.7	37.8	5.5
1958	680.9	59.3	8.7	32.5	4.8
1959	721.7	63.6	8.8	36.2	5.0
1960	737.2	66.9	9.1	37.4	5.1
1961	756.6	66.7	8.8	36.5	4.8
1962	800.3	72.0	9.0	40.4	5.0
1963	832.5	75.1	9.0	43.1	5.2
1964	876.4	82.7	9.4	48.3	5.5
1965	929.3	97.4	10.5	56.8	6.1
1966	984.8	108.0	11.0	64.5	6.5
1967	1,011.4	105.6	10.4	63.6	6.2
1968	1,058.1	109.5	10.3	66.8	6.3
1969	1,087.6	116.8	10.7	71.8	6.6
1970	1,085.6	113.8	10.5	69.9	6.4
1971	1,122.4	112.2	9.2	69.3	5.7
1972	1,185.9	121.0	10.2	76.9	6.5
1973	1,255.0	138.1	11.0	90.7	7.2
1974	1,248.0	135.7	10.9	92.1	7.4
1975	1,233.9	119.3	9.7	81.1	6.6
1976	1,298.2	125.6	9.7	86.1	6.6
1977	1,369.7	140.3	10.2	99.9	7.3
1978	1,438.6	158.3	11.0	113.7	7.9
1979	1,479.4	169.9	11.5	120.8	8.2
1980	1,475.0	165.8	11.2	117.0	7.9
1981(r)	1,512.2	175.0	11.6	121.8	8.1
1982(r)	1,480.0	166.9	11.3	113.5	7.7
1983(r)	1,534.7	171.0	11.2	121.8	7.9
1984(p)	1,639.3	204.9	12.5	148.0	9.0

p - Preliminary. r - Revised.

Sources: U.S. Department of Commerce, "Business Statistics, 1977"; "Survey of Current Business" (monthly).

U.S. BALANCE OF TRADE
1965 to Date

Year	All Merchandise Billions of Dollars Exports	 Imports	 Net Balance	Machine Tools and Parts Millions of Dollars Exports	 Imports	 Net Balance
1965	$ 26.5	$ 21.5	$ 5.0	$ 287.2	$ 68.9	$ 218.3
1966	29.3	25.5	3.8	273.6	137.4	136.2
1967	30.7	26.9	3.8	294.5	203.7	90.8
1968	33.6	33.0	.6	286.0	191.3	94.7
1969	36.4	35.8	.6	323.5	182.5	140.9
1970	42.0	39.8	2.2	403.9	158.5	245.4
1971	42.8	45.5	-2.7	351.0	109.6	241.4
1972	48.8	55.8	-7.0	332.1	141.8	190.3
1973	71.4	70.4	1.0	443.0	211.6	231.4
1974	98.3	103.7	-5.4	566.5	330.3	236.2
1975	107.1	98.0	9.1	705.9	382.4	323.5
1976	114.4	123.4	-9.0	682.8	383.3	299.5
1977	119.7	150.2	-30.5	579.6	482.2	97.4
1978	140.9	174.5	-33.6	738.6	832.4	-93.7
1979	179.2	209.4	-30.2	878.6	1,269.5	-390.9
1980	220.1	244.2	-24.1	1,099.2	1,556.9	-457.7
1981(r)	232.7	261.1	-28.4	1,445.6	1,712.9	-267.3
1982(r)	209.2	244.6	-35.4	1,002.4	1,489.4	-487.0
1983(r)	198.6	258.9	-60.3	691.9	1,100.2	-408.3
1984(p)	219.2	325.5	-106.3	734.9	1,652.7	-917.8

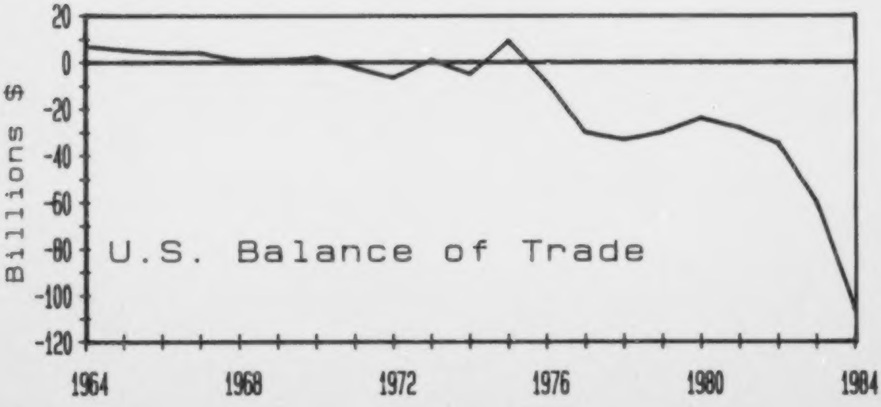
p - Preliminary. r - Revised.

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metal working machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Individual items may not add to totals due to rounding.

Source: All merchandise: U.S. Department of Commerce, "Survey of Current Business," (monthly); Machine Tools: U.S. Bureau of the Census, "EM 522" and "IM 146."

For details on how the values in the above table are computed, see the text introduction to Chapter 5.



VALUE OF U.S. DIRECT FOREIGN INVESTMENTS

Book Value at Year End, 1978 to 1983

(Millions of U.S. Dollars)

	1978	1979	1980	1981(r)	1982(r)	1983(p)
World:						
Total All Industries	$162,727	$187,858	$215,375	$228,348	$221,512	$226,117
Manufacturing	69,669	79,023	89,290	92,388	90,582	90,124
Canada:						
Total All Industries	36,396	40,662	45,119	47,073	46,183	47,538
Manufacturing	15,736	17,531	19,028	19,818	19,724	19,849
United Kingdom:						
Total All Industries	19,527	23,696	28,460	30,316	29,914	30,851
Manufacturing	9,483	11,447	13,833	13,087	12,840	13,061
European Economic Community						
Total All Industries	36,464	42,379	49,040	50,427	47,863	48,027
Manufacturing	22,013	24,506	27,633	28,117	27,351	27,064
Other Western Europe:						
Total All Industries	14,656	16,981	18,787	20,858	21,682	23,584
Manufacturing	3,159	3,676	3,821	4,065	3,938	3,833
Japan:						
Total All Industries	5,406	6,180	6,225	6,762	6,928	8,059
Manufacturing	2,343	2,777	2,954	3,233	3,462	4,071
Australia, New Zealand, & South Africa:						
Total All Industries	8,781	9,579	10,583	12,003	11,588	11,524
Manufacturing	3,559	3,946	4,205	4,703	4,070	3,865
Latin America:						
Total All Industries	31,770	35,220	38,761	38,838	32,546	29,501
Manufacturing	11,153	12,440	14,590	15,809	15,630	14,749
Other Areas:						
Total All Industries	9,727	13,161	18,400	22,072	24,808	27,033
Manufacturing	2,224	2,700	3,226	3,556	3,567	3,632

p - Preliminary. r - Revised.

Source: U.S. Department of Commerce, "Survey of Current Business," (August).

Direct foreign investments include purchases and sales of equity interest in foreign enterprises and capital movements between U.S. corporations and their foreign affiliates.

ESTIMATES OF CAPITAL EXPENDITURES* BY MAJORITY-OWNED FOREIGN AFFILIATES OF U.S. COMPANIES, BY SELECTED COUNTRY OR AREA

(Millions of U.S. Dollars)

	Actual						Projection	
	1978	1979	1980	1981	1982	1983(r)	1984(r)	1985
WORLD								
Total Manufacturing	$11,959	$15,419	$19,540	$19,164	$16,755	$13,724	$14,521	$17,730
Mchy., Except Elec.	3,630	4,749	5,589	5,106	4,900	3,778	3,423	4,077
CANADA								
Total Manufacturing	2,405	2,776	3,728	3,800	2,740	2,590	2,753	3,600
Mchy., Except Elec.	340	403	499	649	601	413	358	540
LATIN AMERICA								
Total Manufacturing	1,491	1,957	2,760	3,114	2,703	1,744	1,961	2,535
Mchy., Except Elec.	290	2[illegible]7	411	422	369	227	289	344
EUROPE								
Total Manufacturing	6,841	9,224	11,127	10,273	9,274	7,824	7,931	9,129
Mchy., Except Elec.	2,638	3,694	4,099	3,423	3,249	2,844	2,412	2,672
UNITED KINGDOM								
Total Manufacturing	1,780	2,596	3,005	2,591	2,529	2,113	2,305	2,578
Mchy., Except Elec.	527	834	784	735	635	600	635	675
FRANCE								
Total Manufacturing	1,072	1,273	1,582	1,316	1,323	1,241	1,112	1,245
Mchy., Except Elec.	620	790	977	821	868	798	608	693
FEDERAL REP. OF GERMANY								
Total Manufacturing	2,122	2,826	3,233	2,653	2,306	2,180	2,209	2,748
Mchy., Except Elec.	828	1,137	1,174	959	894	723	555	642
ITALY								
Total Manufacturing	522	634	870	797	696	639	540	603
Mchy., Except Elec.	D	D	D	D	D	350	202	223
ASIA AND PACIFIC								
Total Manufacturing	718	919	1,281	1,237	1,327	1,004	1,254	1,668
Mchy., Except Elec.	331	355	34(a)	47(a)	57(a)	58(a)	75(a)	486
JAPAN								
Total Manufacturing	401	462	707	666	765	463	556	795
Mchy., Except Elec.	314	337	D	D	D	D	D	407
SOUTH AFRICA								
Total Manufacturing	61	87	117	147	211	174	151	160
Mchy., Except Elec.	8	11	18	19	18	14	D	11
AUSTRALIA								
Total Manufacturing	375	381	453	512	424	323	400	551
Mchy., Except Elec.	21	28	D	D	29	12	23	22

D - Withheld to avoid disclosure. r - Revised.

(a) Excludes Japan.

* - "Capital expenditures" previously were referred to as "property, plant, and equipment expenditures." They represent gross outlays charged to capital accounts to acquire, add to, or improve real property, plant, and equipment. Sales or other dispositions of fixed assets are not netted against these outlays.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

EXPENDITURES ON NEW PLANT AND EQUIPMENT
Major Industries, Selected Years, 1960 to Date (r)

(Billions of Dollars)

Year	All Industries	Total Manufacturing Industries	Durable Goods Industries	Electrical Machinery and Equipment	Non-electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment
1960	$ 39.44	$ 16.36	$ 8.28	$ 1.02	$ 1.21	$ 1.47	$ 0.47
1965	59.52	25.41	13.49	1.69	2.24	3.00	0.74
1969	85.74	36.27	19.97	3.27	3.63	2.99	1.81
1970	91.91	36.99	19.80	3.49	3.78	3.05	1.60
1971	92.91	33.60	16.78	3.03	3.15	2.42	1.12
1972	103.40	35.42	18.22	2.83	3.23	3.00	1.41
1973	120.03	42.35	22.63	3.48	3.95	3.83	1.77
1974	139.67	52.48	26.77	3.80	5.13	4.29	2.31
1975	142.42	53.66	25.37	3.08	4.86	3.33	2.13
1976	158.44	58.53	27.50	3.61	5.43	3.60	2.19
1977	184.82	67.48	32.77	4.61	6.35	5.82	2.50
1978	217.76	78.58	39.46	5.89	7.42	7.19	3.63
1979	254.96	95.92	48.50	7.55	10.17	8.34	4.71
1980	282.80	112.33	55.36	9.77	11.41	9.02	5.96
1981	315.22	126.54	59.81	10.58	13.68	9.83	5.60
1982	310.58	120.68	55.35	11.01	13.44	7.77	4.79
1983	304.78	116.20	53.08	11.42	13.50	7.29	4.04
1984	353.54	138.38	65.95	14.55	15.36	11.11	4.96
1985E	384.40	153.63	75.01	16.52	16.37	15.36	4.91

E - Estimate.   r - Revised.

Sources: U.S. Department of Commerce, "Survey of Current Business," (monthly), Estimate, "Survey of Current Business," (April).

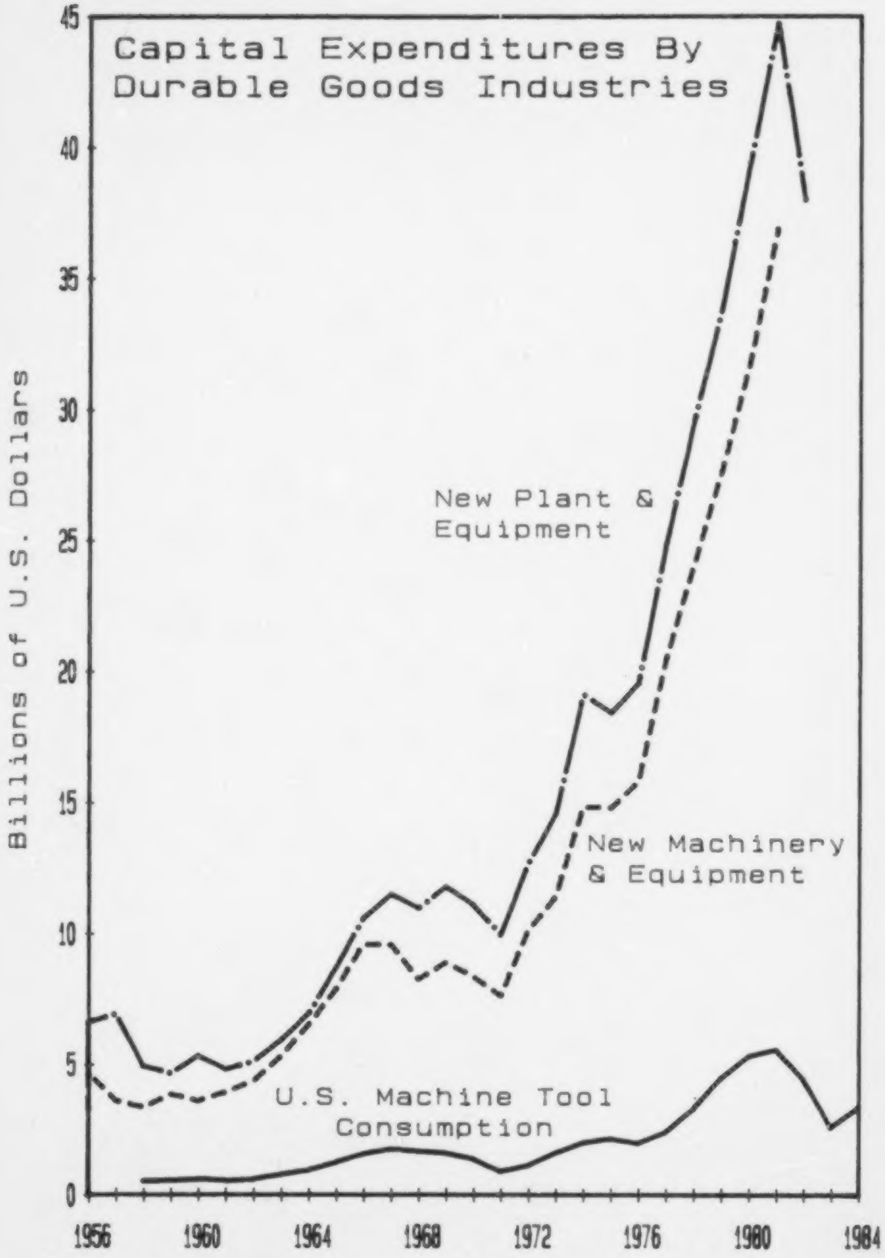
NEW PLANT AND EQUIPMENT PROJECTS
Starts During Year and Carry-Over at Year End, 1965 to 1983

(Billions of Dollars)

	Total Manufacturing		Durables		Electrical Machinery		Nonelectrical Machinery		Transportation Equipment		Public Utilities	
Year	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over	New Starts	Carry-over
1965	$ 31.12	$20.02	$17.14	$11.00	$ 2.32	$1.64	$ 2.75	$1.04	$ 4.82	$ 3.07	$ 8.82	$ 7.67
1967	30.31	20.96	16.10	12.07	3.05	2.51	2.70	1.08	3.87	2.67	13.53	14.12
1968	33.81	22.44	18.43	12.57	2.91	2.26	2.81	.99	4.90	3.32	12.68	16.28
1969	39.80	25.97	21.65	14.25	4.59	3.58	3.82	1.18	4.86	3.38	14.85	19.43
1970	33.82	22.81	17.41	11.86	2.91	2.99	3.66	1.06	4.12	2.85	15.76	23.16
1971	31.78	20.99	15.86	10.93	2.35	2.31	2.98	.89	3.78	3.09	20.69	29.15
1972	38.97	24.54	19.30	12.01	2.63	2.10	3.39	1.04	4.74	3.42	29.77	42.65
1973	53.21	35.38	28.07	17.33	4.12	2.72	4.43	1.50	7.02	4.79	36.22	60.91
1974	61.24	43.41	31.07	21.59	3.55	2.42	6.20	2.47	7.11	5.03	47.72	88.79
1975	56.51	45.00	23.71	18.98	2.59	1.88	5.33	2.84	4.40	3.52	39.32	108.14
1976	59.38	44.44	29.80	20.30	4.27	2.49	6.20	3.52	6.64	3.77	28.09	113.86
1977	77.40	52.62	36.59	22.85	4.80	2.62	6.84	3.77	10.63	5.33	34.53	121.60
1978	88.16	61.05	46.20	28.62	6.27	3.20	7.71	4.27	15.62	8.94	38.74	130.39
1979	112.98	75.35	59.18	36.72	8.16	4.08	12.66	6.41	19.01	12.63	21.67	118.10
1980	123.32	85.16	57.67	36.92	10.25	5.11	10.72	5.81	16.50	11.42	43.69	130.16
1981	135.19	93.73	68.89	44.37	11.50	6.49	15.95	8.75	19.35	12.26	34.98	126.04
1982	104.35	79.21	45.73	33.25	8.97	4.75	11.02	6.73	13.87	10.97	15.11	99.48
1983	114.51	82.04	53.28	34.90	12.49	6.33	12.62	7.06	13.55	11.50	26.98	85.46

Note: The publication of this data was discontinued in 1983.

Source: U.S. Department of Commerce, "Survey of Current Business" (March).



Source: U.S. Bureau of Census & NMTBA

EXPENDITURES ON NEW PLANT AND EQUIPMENT BY DURABLE GOODS INDUSTRIES AND MACHINE TOOL CONSUMPTION

1953 to Date

	New Plant & Equipment Expenditures Billions of Dollars				U.S. Machine Tool Consumption (c) (Mil. Dollars)	Machine Tool Consumption As a % of		
	BEA (a,r)	Census (b)				BEA (a,r)	Census (b)	
Year	Total	Total	Plant	Equipment		Total	Total	Equipment
1953	$ 5.31	$ 4.26	$1.25	$ 3.01	NA	NA	NA	NA
1954	4.91	4.32	1.20	3.12	NA	NA	NA	NA
1955	5.41	4.59	1.28	3.31	NA	NA	NA	NA
1956	7.45	6.62	1.95	4.67	NA	NA	NA	NA
1957	7.84	6.94	2.20	4.74	NA	NA	NA	NA
1958	5.61	4.94	1.33	3.61	$ 554.9	9.9%	NA	NA
1959	6.73	4.64	1.29	3.35	587.1	8.7	13.6%	18.8%
1960	8.28	5.34	1.47	3.87	634.0	7.7	12.3	16.9
1961	7.42	4.81	1.21	3.60	544.4	7.3	12.3	16.4
1962	7.81	5.12E	1.17E	3.95E	625.0	8.0	13.5	17.4
1963	8.64	5.92	1.55	4.37	798.3	9.2	14.7	19.9
1964	10.99	6.95	1.64	5.31	967.2	8.8	15.1	19.7
1965	13.49	8.70	2.18	6.52	1,263.5	9.4	15.4	20.6
1966	17.23	10.61E	2.72E	7.89E	1,588.9	9.2	15.6	21.0
1967	17.82	11.52	1.92	9.60	1,780.0	10.0	16.1	19.3
1968	17.93	10.97	2.71	8.26	1,669.8	9.3	15.6	20.7
1969	19.97	11.81	2.90	8.91	1,605.9	8.0	14.1	18.7
1970	19.80	11.11	2.74	8.37	1,391.5	7.0	13.0	17.3
1971	16.78	9.96	2.34	7.62	896.4	5.3	9.6	12.6
1972	18.22	12.70	2.56	10.14	1,145.1	6.3	9.5	12.0
1973	22.63	14.58	3.15	11.43	1,629.4	7.2	11.9	15.1
1974	26.77	19.13	4.26	14.87	2,026.2	7.6	11.1	14.3
1975	25.37	18.42	3.60	14.82	2,187.0	8.6	12.5	15.5
1976	27.50	19.57	3.75	15.82	1,981.6	7.2	11.0	13.6
1977	32.77	24.93	4.41	20.52	2,427.6	7.4	10.3	12.5
1978	39.46	29.66	5.52	24.14	3,324.8	8.4	11.3	13.9
1979	48.50	33.91	6.22	27.69	4,488.7	9.3	13.9	17.1
1980	55.36	39.42	7.62	31.80	5,338.0	9.6	13.8	17.1
1981	59.81	44.75	7.83	36.91	5,593.2	9.4	13.1	15.9
1982(r)	55.35	38.0	NA	NA	4,447.4	8.0	11.7	NA
1983(r)	53.08	NA	NA	NA	2,606.9	4.9	NA	NA
1984	65.95	NA	NA	NA	3,358.0	5.1	NA	NA

NA - Not Available. E - Estimate. r - Revised.

(a) Bureau of Economic Analysis: covers all establishments (Manufacturing and Nonmanufacturing) operated by Manufacturing companies.

(b) Bureau of the Census: covers all Manufacturing establishments.

(c) U.S. domestic machine tool shipments plus imports.

Source: Bureau of Economic Analysis, U.S. Department of Commerce, "Survey of Current Business;" Bureau of the Census, "Annual Survey of Manufactures," M(AS)-5, Expenditures for New Plant and New Equipment; U.S. Bureau of the Census, "FT 135" and earlier reports; and National Machine Tool Builders' Association.

The last three columns in the above table show the percentage of investment for machine tools has declined since the 1960's. The U.S. share of machine tool investment has declined even more because imports have increased their share of the U.S. machine tool market. See the table in the beginning of chapter 5 on machine tool imports as a percentage of U.S. consumption.

EXPENDITURES FOR NEW MACHINERY AND EQUIPMENT

By Major Machine Tool Consuming Industries, 1947 to Date

(Millions of Dollars)

Year	Durable Goods Industries	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles & Equipment (a)	Aircraft & Parts
1947	NA	$ 212.7	$ 312.5	$ 179.7	$ 75.5	$ 18.8
1948	NA	NA	NA	NA	NA	NA
1949	NA	167.8	214.5	133.6	147.9	27.2
1950	NA	223.9	213.0	145.4	216.0	S
1951	NA	246.0	348.5	192.7	290.5	79.7
1952	NA	238.9	342.5	215.9	270.5	77.9
1953	$ 3,010	288.9	404.1	258.8	406.9	83.4
1954	3,120	323.2	425.5	247.6	621.0	87.8
1955	3,309	335.0	440.6	262.3	484.9	115.7
1956	4,669	361.1	545.3	342.3	854.9	181.4
1957	4,740	398.2	553.6	348.4	581.0	209.7
1958	3,605	316.8	487.0	311.1	271.0	129.2
1959	3,350	357.4	399.6	375.2	310.5	128.3
1960	3,866	360.4	435.1	449.0	371.0	124.4
1961	3,600	314.3	416.6	424.0	319.4	149.7
1962	3,946	390.2	447.8	476.4	366.4	189.4
1963	4,366	460.1	612.1	525.9	510.4	191.8
1964	5,306	549.4	713.3	568.2	712.0	204.6
1965	6,520	612.0	960.3	810.5	889.9	206.3
1966	7,889	725.6	1,157.2	1,019.6	893.9	414.7
1967	9,595	834.2	1,361.5	1,087.9	643.0	546.6
1968	8,256	799.5	1,299.8	1,061.3	632.0	463.8
1969	8,905	951.9	1,449.7	1,239.2	781.2	479.0
1970	8,365	872.0	1,377.3	1,134.6	731.7	292.9
1971	7,619	808.6	1,292.7	1,081.1	620.4	197.5
1972	10,139	1,030.7	1,478.2	1,123.4	1,921.3	139.8
1973	11,432	1,345.4	1,791.2	1,567.9	1,625.3	197.6
1974	14,868	1,470.4	2,456.8	1,899.9	2,087.5	227.6
1975	14,821	1,628.9	2,571.6	1,519.1	1,653.6	286.7
1976	15,822	1,724.8	2,611.1	1,816.5	1,908.1	350.6
1977	20,525	2,280.8	3,502.5	2,360.2	3,195.4	417.5
1978	24,142	2,494.4	4,427.7	2,937.9	3,968.6	575.1
1979	27,689	2,741.6	5,326.0	3,650.3	4,243.4	936.4
1980	31,803	3,219.8	6,086.1	4,780.1	4,752.6	1,262.7
1981	36,912	3,791.8	7,040.1	5,098.1	7,539.0	1,325.4

NA - Not Available. S - Estimate did not meet publication standards.

(a) Beginning in 1972, expenditures for special automotive tools (such as dies, die sets, jigs, fixtures, etc.) are included as capital expenditures. For transition information, special tooling expenditures amount to $1.2 billion for 1972 and $840 million for 1973.

Source: U.S. Bureau of the Census, "Annual Survey of Manufactures, M(AS)-5, Expenditures for New Plant and New Equipment".

CAPITAL FORMATION IN MANUFACTURING INDUSTRIES

Selected Years, 1950 to Date

(Billions of Dollars)

Year	Purchases		Depreciation (a)		Net Investment (b)		Net Value (c)	
	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment	Total (d)	Equipment
In Current Dollars								
1950	$ 6.1	$ 4.3	$ 4.7	$ 3.0	$ 1.4	$ 1.3	$ 55.1	$ 26.4
1955	9.3	6.3	7.3	5.0	2.0	1.3	77.0	41.0
1960	10.8	7.8	10.0	7.3	.8	.5	95.6	54.7
1965	18.3	13.8	12.0	8.8	6.3	5.0	116.4	68.2
1970	23.8	17.5	18.9	14.0	4.9	3.5	191.2	112.3
1971	22.5	16.6	20.3	14.9	2.2	1.7	201.3	117.7
1972	25.8	19.9	21.4	15.7	4.4	4.2	213.4	124.0
1973	29.0	22.4	23.0	16.7	6.0	5.7	236.1	136.0
1974	38.3	29.3	26.5	19.0	11.8	10.3	292.7	170.4
1975	39.8	31.6	31.6	23.3	8.2	8.3	319.3	198.2
1976	43.4	34.7	34.5	26.1	8.9	8.6	343.9	219.0
1977	51.2	41.8	38.5	29.5	12.7	12.3	387.3	248.8
1978	58.2	46.6	43.2	33.2	15.0	13.4	438.2	281.0
1979	74.1	58.9	50.1	38.5	24.0	20.4	508.8	328.1
1980	77.2	60.5	58.0	44.6	19.2	15.9	579.7	377.7
1981(r)	82.3	64.2	65.7	51.4	16.6	12.8	636.4	423.5
1982(r)	72.8	54.4	71.4	56.5	1.4	2.1	665.0	440.9
1983(r)	68.1	54.5	74.7	59.2	−6.6	−4.7	672.4	446.3
1984	83.4	68.4	78.1	62.0	5.3	6.4	691.6	460.6
In 1972 Dollars								
1950	$12.4	$ 8.2	$ 9.5	$ 5.9	$ 2.9	$ 2.3	$106.4	$ 50.2
1955	16.6	10.2	12.2	8.2	4.4	2.0	127.1	64.6
1960	15.6	10.3	14.1	9.6	1.5	.7	140.4	71.9
1965	24.5	17.3	15.9	11.1	8.6	6.2	158.1	84.8
1970	25.9	18.5	20.4	14.8	5.5	3.7	202.2	115.8
1971	23.1	16.9	20.9	15.2	2.2	1.7	204.6	117.8
1972	25.8	19.9	21.4	15.7	4.4	4.2	209.2	122.2
1973	27.9	21.8	22.1	16.3	5.8	5.5	215.3	128.0
1974	33.4	26.3	23.0	17.1	10.4	9.2	225.9	137.4
1975	30.4	24.5	24.0	18.0	6.4	6.5	232.7	144.3
1976	31.6	25.3	25.0	19.0	6.6	6.3	239.7	151.1
1977	35.3	28.9	26.2	20.1	9.1	8.8	249.2	160.3
1978	37.6	30.5	27.6	21.5	10.0	9.0	259.5	169.7
1979	44.5	36.4	29.4	23.1	15.1	13.3	275.1	183.3
1980	42.7	34.7	31.3	25.0	11.4	9.7	287.0	193.6
1981(r)	42.8	34.6	33.0	26.6	9.8	8.0	297.2	202.1
1982(r)	37.0	28.9	34.5	28.0	2.5	.9	300.3	203.7
1983(r)	34.9	29.0	35.6	29.0	.7	0	300.1	204.3
1984	42.2	36.0	36.9	30.3	5.3	5.7	306.0	210.5

r - Revised.

(a) Straight-line depreciation.
(b) Represents the difference between the purchase and depreciation series.
(c) Represents net value in preceding year plus net investment based on straight-line depreciation for year shown.
(d) Total includes equipment and structures.

Source: U.S. Bureau of Economic Analysis.

Data refer to privately owned manufacturing industries and are based on the fixed capital formation components of the gross national product. Stocks are as of end of year; investment and depreciation are annual totals.

CAPITAL APPROPRIATIONS AND BACKLOG OF UNSPENT APPROPRIATIONS (a)

By Selected Industry Groups, 1962 to Date

	All Manufacturing		Durables		Non-Electrical Machinery	
Year	Approp.	Backlog	Approp.	Backlog	Approp.	Backlog
In Current Dollars (Billions)						
1962	$ 11.7	$ 8.5	$ 5.4	$ 4.5	$ 0.8	$0.9
1963	13.3	10.5	6.4	5.6	0.9	1.0
1964	17.9	14.0	8.7	7.2	1.4	1.1
1965	22.3	17.9	11.6	9.4	2.1	1.3
1966	25.4	20.2	14.0	11.4	2.8	1.5
1967	23.9	19.9	12.0	11.0	2.5	1.4
1968	24.8	20.9	12.6	11.5	2.4	1.3
1969	29.5	23.4	15.0	12.4	3.0	1.3
1970	25.3	20.9	12.4	10.8	3.1	1.2
1971	23.1	18.9	11.2	9.4	2.7	1.3
1972	28.8	23.3	14.1	11.8	3.2	1.8
1973	42.9	37.1	21.6	18.7	4.3	2.6
1974	53.7	49.8	24.9	22.7	5.8	3.8
1975	45.0	46.4	16.2	18.1	3.7	3.5
1976	50.0	47.5	22.4	21.0	5.0	4.0
1977	63.4	56.5	26.6	24.6	5.1	4.2
1978	67.2	63.4	33.1	31.1	6.3	5.0
1979	88.5	76.5*	43.3	38.8*	10.2	6.9*
1980	104.6	90.7*	44.3	40.8*	9.4	6.5*
1981	107.0	92.5*	42.1	39.6*	12.7	8.6*
1982	87.5	70.8*	32.0	27.0*	8.7	5.4*
1983(r)	88.2	73.5*	37.5	29.5*	7.9	5.3*
1984(p)	116.1	97.6*	59.6	46.8*	10.9	7.1*
In Constant 1972 Dollars (Billions)						
1962	$ 16.1	$14.4	$7.3	$ 7.8	$ 1.1	$1.4
1963	18.2	17.1	8.5	9.2	1.2	1.4
1964	24.3	21.8	11.6	11.3	1.8	1.6
1965	29.6	27.1	15.2	14.3	2.7	1.8
1966	32.8	30.0	17.7	16.8	3.5	2.1
1967	30.0	29.6	14.8	16.3	3.1	1.9
1968	29.6	30.8	14.9	16.9	2.8	1.8
1969	33.6	33.7	17.0	17.9	3.4	1.8
1970	27.5	31.0	13.5	16.2	3.4	1.8
1971	23.9	28.9	11.5	14.8	2.8	1.9
1972	28.8	33.3	14.1	17.2	3.2	2.3
1973	41.6	46.7	21.0	23.9	4.1	3.1
1974	47.4	58.0	22.2	27.5	5.1	4.2
1975	34.6	55.3	12.6	23.9	2.9	3.9
1976	36.5	56.1	16.4	26.1	3.7	4.3
1977	43.7	62.3	18.5	28.6	3.6	4.4
1978	43.2	66.8	21.3	32.8	4.1	4.9
1979	52.5	74.6*	26.0	37.5*	6.2	6.1*
1980	58.5	82.6*	24.9	38.6*	5.3	5.9*
1981	55.0	83.5*	22.4	38.0*	6.7	7.0*
1982	43.7	72.7*	16.3	31.6*	4.4	5.4*
1983(r)	44.7	74.0*	19.2	32.9*	4.0	5.4*
1984(p)	57.9	86.0*	29.7	41.4*	5.4	6.3*

p - Preliminary estimate. r - Revised. * - Seasonally adjusted.

(a) These data are the results of The Conference Board's survey of the 1,000 largest U.S. manufacturers and pertain only to their domestic capital investment. This series is copyrighted by The Conference Board and can be reproduced only with their written permission.

Source: The Conference Board.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Selected Industry Groups, 1980 to Date

(Millions of Dollars)

	1980		1981		1982	
Industry Group	Total	Machinery & Equipment	Total	Machinery & Equipment	Total	Machinery & Equipment
All Operating Manufacturing Establishments	$573,570	$433,995	$630,438	$479,233	NA	NA
Fabricated Metal Products	33,721	25,369	36,363	27,416	$39,886	NA
Nonelectrical Machinery	52,662	38,324	59,740	43,580	66,265	NA
Construction & Related Machinery	9,864	6,747	11,226	7,754	12,608	NA
Metalworking Machinery	6,546	4,996	7,269	5,552	7,473	$5,695
Metal Cutting Machine Tools	1,453	1,036	1,627	1,164	1,682	1,209
Metal Forming Machine Tools	612	444	636	456	742	540
Other Metalworking Machinery	4,481	3,516	5,007	3,932	5,049	3,946
Special Industrial Machinery	3,458	2,395	3,793	2,638	4,141	NA
General Industrial Machinery	7,378	5,490	8,191	6,106	9,189	NA
Office & Computing Machines	8,319	5,895	10,008	7,023	11,911	NA
Other Nonelectrical Machinery	17,097	12,801	9,914	7,569	20,943	NA
Electrical Machinery	35,278	25,340	40,430	29,051	46,979	NA
Transportation Equipment	45,636	32,814	53,361	39,437	58,000	NA
Instruments & Related Products	11,825	7,941	13,360	9,051	15,419	NA

NA - Not Available.

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, 1977 "Census of Manufactures," "Annual Survey of Manufactures."

The tables appearing on this and the following page are included to provide some measure of the total stock of fixed assets in selected machine tool consuming industries. However, neither table presents an ideal measurement. Data in the "Gross Book Value" table include the total original cost of assets until the time they are fully depreciated. These are available only on an annual basis. The "Net Value" table is more current and is available on a quarterly basis but includes land, mineral rights, depletion, and amortization.

The data in the tables are not directly comparable due to these definitional differences in sample coverage and statistical methodology. For additional information on the gross book value of depreciable assets in the machine tool industry, see chapter 8.

NET VALUE OF PROPERTY, PLANT AND EQUIPMENT (a)

Selected Industry Groups, 1975 to Date

(Millions of Dollars)

Year: Qtr.	All Manufacturing	Fabricated Metal Products	Nonelectrical Machinery	Electrical Machinery	Transportation Equipment	Instruments and Related Products
1975:1	$266,114	$10,487	$21,884	$14,854	$21,529	$ 6,480
:2	273,796	10,865	22,541	15,035	22,382	6,645
:3	278,565	10,751	22,854	15,157	22,557	6,659
:4	283,689	10,816	23,018	14,977	22,515	6,919
1976:1	287,362	11,160	23,342	15,001	21,669	6,938
:2	293,435	11,149	23,786	15,155	21,673	6,990
:3	300,895	11,363	23,967	15,246	21,924	7,138
:4	307,360	11,469	24,745	15,452	21,927	7,210
1977:1	310,962	11,443	25,206	15,780	21,808	7,240
:2	318,941	11,797	25,940	15,735	22,513	7,417
:3	327,798	12,144	26,635	16,366	23,317	7,406
:4	339,809	12,286	27,805	17,051	24,369	7,555
1978:1	348,397	12,301	28,893	17,063	24,874	7,828
:2	357,773	12,720	29,803	17,551	26,074	7,820
:3	367,736	13,450	30,849	18,179	27,331	7,896
:4	382,953	14,208	32,168	19,175	28,883	8,162
1979:1	393,630	14,681	33,204	19,480	29,982	8,343
:2	405,188	15,213	34,931	20,048	31,289	8,631
:3	418,836	15,556	36,345	20,925	32,857	8,925
:4	441,415	15,597	39,093	22,222	34,130	9,447
1980:1	455,115	15,871	41,330	22,360	35,514	9,549
:2	468,348	16,309	42,619	23,204	36,913	9,826
:3	487,080	16,569	44,381	24,323	38,312	10,253
:4	515,022	18,607	46,718	26,186	39,861	10,761
1981:1	529,406	18,886	47,618	27,048	41,440	11,101
:2	547,707	19,391	49,446	28,072	42,533	11,491
:3	565,901	19,493	51,334	29,106	43,911	11,837
:4	586,077	19,846	54,078	30,817	44,746	12,425
1982:1	604,415	20,269	55,103	30,912	45,858	12,771
:2	618,376	20,952	56,950	31,808	46,481	13,047
:3	631,131	21,172	58,678	32,913	47,362	13,579
:4	643,348	21,688	59,010	33,407	48,240	13,939
1983:1	648,112	22,380	58,624	33,792	48,033	14,111
:2	653,660	21,964	58,452	33,735	47,702	14,372
:3	658,354	22,172	58,386	34,787	47,700	14,231
:4(r)	663,282	21,464	50,403	35,921	49,406	14,797
1984:1	669,032	21,456	50,889	36,636	48,473	14,941
:2	678,085	21,814	51,033	37,804	49,622	15,164
:3	688,359	22,247	50,761	39,843	50,438	15,505
:4(p)	702,179	22,275	52,060	41,268	52,695	16,012

p - Preliminary. r - Revised.

(a) Depreciable fixed assets including construction in progress, land and mineral rights less accumulated depreciation, depletion and amortization.

Source: Federal Trade Commission, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).

Net Value of Property, Plant and Equipment data are collected quarterly by extensive survey of manufacturing, mining and trade corporations. Each corporation is required to show gross receipts by source industry and is classified in the particular industry which accounts for the largest share of gross receipts. Please note that these procedures may lead to a conglomerate corporation being assigned to an industry from which only a small proportion of its receipts are obtained. For this reason, the above data should be used with caution.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Short-term Rates, 1969 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1969	8.21%	7.32%	7.86%	8.82%	8.83%
1970	8.48	8.86	8.49	8.50	8.07
1971(a)	6.48	6.59	6.01	6.51	6.18
1972	5.82	5.52	5.59	5.84	6.33
1973	8.30	6.52	7.35	9.24	10.08
1974	11.28	9.91	11.15	12.40	11.64
1975	8.65	9.94	8.16	8.22	8.29
1976	7.52	7.54	7.44	7.80	7.28
1977	7.85	7.48	7.37	7.87	8.66
1978	9.84	8.95	9.01	9.97	11.44
1979	13.18	12.27	12.34	12.31	15.81
1980	15.17	15.67	17.75	11.56	15.70
1981	19.56	19.91	19.99	21.11	17.23
1982	14.69	17.13	17.11	13.27	11.26
1983	10.64	10.20	10.31	11.09	10.95
1984	12.02	11.06	12.45	13.29	11.29

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .16% decrease from 6.75% to 6.59%.

Source: Federal Reserve Board.

INTEREST RATES CHARGED BY BANKS ON BUSINESS LOANS
Long-term Rates, 1969 to Date
(Percent per Annum)

Year	Average Annual Rate	February	May	August	November
1969	8.01%	6.64%	7.87%	8.66%	8.86%
1970	8.47	8.67	8.25	8.66	8.31
1971(a)	6.57	6.82	6.36	6.67	6.44
1972	6.12	5.64	5.87	6.31	6.67
1973	8.83	7.12	7.67	9.85	10.68
1974	11.70	10.16	11.41	13.08	12.16
1975	9.06	10.26	8.22	8.89	8.88
1976	7.99	8.02	8.02	8.45	7.48
1977	8.52	9.05	8.24	8.09	8.71
1978	10.11	9.19	9.67	10.20	11.38
1979	12.98	12.01	12.08	12.25	15.56
1980	15.32	15.79	18.37	12.06	15.07
1981	19.52	19.26	19.25	20.62	18.94
1982	15.25	16.59	16.96	15.22	12.24
1983	12.01	11.81	11.46	11.83	12.94
1984	12.89	11.92	13.12	13.81	12.69

(a) Statistical methodology changed in 1971. Net effect of the revision in February 1971 amounted to .08% decrease from 6.90% to 6.82%.

Source: Federal Reserve Board.

COMPARATIVE CAPACITY UTILIZATION MEASURES
Total Manufacturing, 1968 to Date

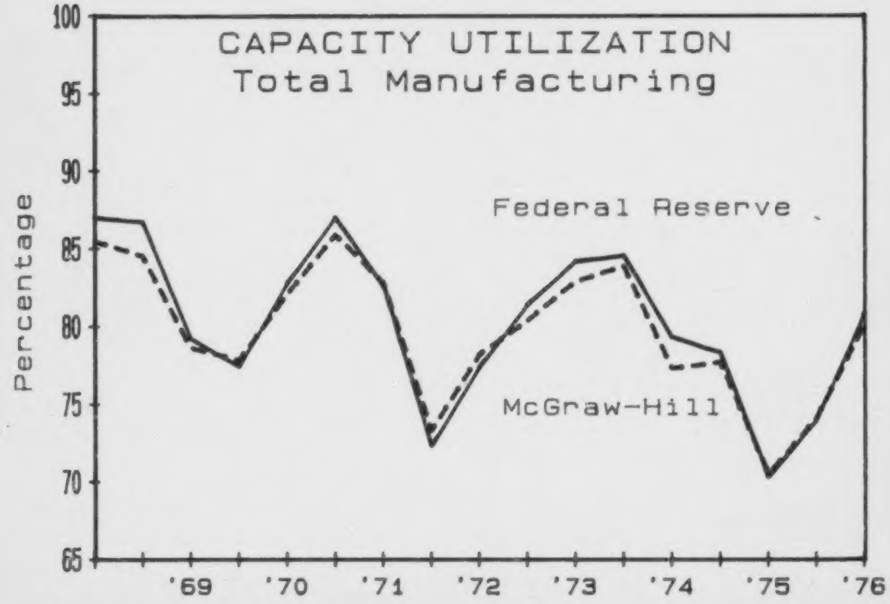
Year	Federal Reserve Board (r)	Bureau of Economic Analysis	McGraw-Hill
1968	87.0%	85%	85.5%
1969	86.7	85	84.5
1970	79.2	81	78.6
1971	77.4	80	77.8
1972	82.8	83	82.1
1973	87.0	86	85.9
1974	82.6	83	82.8
1975	72.3	77	73.3
1976	77.4	81	78.2
1977	81.4	83	80.4
1978	84.2	84	82.9
1979	84.6	83	83.9
1980	79.3	78	77.3
1981	78.3	76	77.7
1982	70.3	70	70.5
1983(r)	74.0	74	74.1
1984	80.8	(a)	80.1

r - Revised.

(a) The publication of this data was discontinued in 1983.

Sources: Federal Reserve Board; U.S. Department of Commerce, Bureau of Economic Analysis; McGraw-Hill Publications Company.

For further explanation of "Capacity Utilization" see chapter introduction.



CAPACITY UTILIZATION IN MANUFACTURING
Federal Reserve Board, Operating Rates (a)
1967 to Date

	Total Mfg.	Total Durables	Electrical Machinery	Machinery, Except Electrical	Motor Vehicles(b)	Primary Metals	Fabricated Metals
1967	86.7%	87.0%	87.7%	90.7%	79.8%	85.5%	86.6%
1968	87.0	86.7	84.0	85.1	93.0	86.6	86.2
1969	86.7	86.1	82.3	86.0	90.5	91.7	83.3
1970	79.2	76.1	73.5	77.9	68.8	83.0	74.4
1971	77.4	73.3	70.0	69.0	82.2	76.7	72.1
1972	82.8	79.7	76.8	77.6	86.0	85.8	77.4
1973	87.0	86.2	84.2	86.6	94.5	96.6	84.0
1974	82.6	81.6	79.9	87.1	78.4	92.1	78.8
1975	72.3	69.6	66.0	72.0	64.5	72.9	67.3
1976	77.4	74.8	71.6	72.7	81.1	80.7	74.0
1977	81.4	79.4	78.6	77.8	89.1	81.0	80.1
1978	84.2	82.9	83.3	82.1	89.0	87.0	83.8
1979	84.6	84.1	87.2	84.2	78.2	88.6	85.5
1980	79.3	77.9	84.6	79.2	57.8	74.7	78.4
1981	78.3	76.7	80.0	78.5	59.0	78.3	77.3
1982	70.3	66.9	70.5	67.0	54.3	54.2	65.4
1983	74.0	70.3	72.7	66.4	68.9	62.0	67.2
1984	80.8	79.0	80.2	76.5	82.5	72.5	77.4
1980 1st Qtr.	82.6	81.6	88.2	81.3	62.3	85.0	82.8
2nd Qtr.	78.0	76.5	84.5	78.7	52.7	70.2	77.9
3rd Qtr.	77.1	75.1	82.5	77.7	54.0	63.3	75.4
4th Qtr.	79.3	78.3	83.2	79.1	62.0	80.2	77.4
1981 1st Qtr.	79.5	78.0	81.3	79.0	59.3	83.9	77.8
2nd Qtr.	79.3	77.8	80.9	79.5	63.9	78.1	77.6
3rd Qtr.	79.0	77.5	80.7	79.7	59.6	80.2	78.6
4th Qtr.	75.3	73.3	77.3	75.9	53.3	71.0	75.0
1982 1st Qtr.	72.4	69.5	73.2	71.9	50.2	63.2	69.7
2nd Qtr.	70.8	67.8	71.8	67.9	58.1	53.6	66.4
3rd Qtr.	69.8	66.2	69.6	64.8	58.1	52.3	63.9
4th Qtr.	68.2	63.9	67.6	63.4	50.8	47.5	61.5
1983 1st Qtr.	70.2	66.0	68.6	62.4	59.4	55.2	63.3
2nd Qtr.	72.5	68.5	70.9	65.0	64.8	56.3	65.0
3rd Qtr.	75.8	72.1	74.1	68.3	72.7	64.5	68.7
4th Qtr.	77.4	74.5	77.2	70.0	78.6	69.9	71.7
1984 1st Qtr.	79.8	77.6	79.0	73.5	84.5	73.1	75.1
2nd Qtr.	80.8	78.8	79.9	76.7	81.4	72.2	77.0
3rd Qtr.	81.6	80.0	81.0	78.6	82.2	73.0	78.4
4th Qtr.	81.0	79.4	80.8	76.9	81.7	71.7	79.3

(a) Quarterly data is seasonally adjusted.
(b) Includes Parts.

Source: Federal Reserve Board.

CAPACITY UTILIZATION IN MANUFACTURING
McGraw-Hill, Operating Rates, Seasonally Adjusted
1967 to Date

Year	Total Mfg.	Total Durables	Metal-Working Industries	Fabricated Metals	Electrical Machinery	Machinery, except Electrical	Motor Vehicles and Parts
1967	85.4%	84.9%	86.6%	86.6%	86.3%	87.3%	79.3%
1968	85.5	84.7	85.9	84.7	83.3	85.4	93.0
1969	84.5	84.0	84.3	81.4	78.0	87.9	94.3
1970	78.6	75.1	73.3	72.5	67.3	79.6	74.0
1971	77.8	73.5	71.5	69.8	65.2	72.2	93.9
1972	82.1	78.7	76.8	72.6	70.9	77.5	103.5
1973	85.9	84.7	83.2	78.6	79.8	84.1	104.8
1974	82.8	80.9	79.6	78.5	78.6	84.1	76.7
1975	73.3	69.4	69.2	71.7	64.6	72.3	64.6
1976	78.2	75.0	74.2	77.8	73.2	75.0	76.1
1977	80.4	78.2	78.1	78.5	78.1	77.0	87.0
1978	82.9	81.5	81.4	81.8	82.0	81.1	85.5
1979	83.9	83.0	83.6	84.8	84.1	85.6	78.5
1980	77.3	74.6	76.1	75.3	76.6	81.3	59.3
1981	77.7	75.3	75.6	77.8	79.7	80.6	62.7
1982(r)	70.5	66.0	67.7	65.0	74.1	68.0	59.1
1983(r)	74.1	70.1	70.4	68.3	75.5	67.3	73.0
1984(p)	79.9	78.2	78.3	76.7	81.1	78.2	85.4
1980 1st Qtr.	82.3	80.8	81.5	81.9	82.9	86.2	65.3
2nd Qtr.	76.3	73.5	75.5	74.7	77.0	81.4	54.6
3rd Qtr.	73.7	70.0	72.5	70.1	72.8	78.4	54.2
4th Qtr.	76.9	74.2	74.9	74.3	73.7	79.2	63.0
1981 1st Qtr.	78.6	76.2	75.8	79.7	79.0	81.4	60.9
2nd Qtr.	78.8	76.8	77.2	79.7	80.3	81.7	68.6
3rd Qtr.	78.8	76.5	76.7	78.8	81.0	82.0	64.7
4th Qtr.	74.6	71.5	72.6	73.0	78.4	77.1	56.7
1982 1st Qtr.	71.9	68.1	69.2	68.0	76.1	72.5	52.7
2nd Qtr.	70.9	67.0	69.0	65.9	75.4	68.8	63.4
3rd Qtr.	70.5	66.0	67.8	64.8	73.5	66.8	64.0
4th Qtr.	68.6	63.0	64.9	61.5	71.2	63.9	56.1
1983 1st Qtr.(r)	70.0	65.2	66.8	63.3	71.6	62.5	63.7
2nd Qtr.(r)	72.9	68.5	68.5	66.4	74.3	65.8	69.2
3rd Qtr.(r)	76.3	72.2	72.0	71.2	76.7	69.8	77.3
4th Qtr.(r)	77.6	74.4	74.1	72.4	79.4	71.3	81.8
1984 1st Qtr.(r)	79.4	77.3	76.9	74.9	81.6	74.6	87.0
2nd Qtr.	80.2	78.2	77.9	76.6	81.4	77.9	84.6
3rd Qtr.	80.7	79.1	79.6	77.9	81.6	80.7	85.2
4th Qtr.	79.4	78.0	78.8	77.5	79.7	80.1	84.6
1985 1st Qtr.	78.9	77.7	78.2	77.0	77.2	79.2	86.5

r - Revised. p-Preliminary.

Source: McGraw-Hill Publications Company.

INDUSTRIAL PRODUCTION INDEXES (r)

Major and Selected Industry Groupings, 1964 to Date

1977 = 100 (Quantity of Output Basis)

Year	Total Industrial Production	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nonelectrical Machinery
1964	60.1	59.3	60.3	NA	67.0	51.7
1965	66.1	65.7	68.6	NA	73.6	58.2
1966	72.0	71.7	76.2	NA	78.8	67.6
1967	73.5	73.1	77.0	91.4	82.5	68.9
1968	77.6	77.2	80.8	94.7	86.9	69.5
1969	81.2	80.6	84.0	101.9	88.4	75.2
1970	78.5	77.0	77.6	94.8	81.9	72.8
1971	79.6	78.2	77.3	89.9	81.5	67.6
1972	87.3	86.4	86.3	100.7	89.4	78.5
1973	94.4	94.0	96.3	114.3	99.4	91.7
1974	93.0	92.6	94.3	110.7	95.4	97.7
1975	84.8	83.4	82.6	88.2	82.7	84.5
1976	92.6	91.9	91.1	98.7	91.6	88.8
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	106.5	107.1	108.2	107.0	105.7	111.7
1979	110.7	111.5	113.9	108.5	109.4	122.6
1980	108.6	108.2	109.1	90.4	101.8	123.3
1981	111.0	110.5	111.1	95.0	101.6	129.8
1982	103.1	102.2	99.9	65.8	86.6	115.6
1983	109.2	110.2	107.7	73.0	89.1	118.3
1984	121.8	123.9	124.8	82.4	102.8	142.0

r - Revised. NA - Not Available.

Source: Federal Reserve Board.

INDUSTRIAL PRODUCTION INDEXES (r)

(Continued)

Year	Electrical Machinery	Transportation Equipment	Motor Vehicles and Parts	Aerospace and Misc.	Instruments
1964	44.9	66.8	52.7	93.6	37.5
1965	53.5	79.4	67.3	101.3	43.1
1966	64.2	85.1	66.2	121.5	47.3
1967	64.5	83.2	58.2	132.5	51.4
1968	68.1	90.4	69.7	130.0	56.6
1969	72.5	89.7	70.0	127.0	60.8
1970	69.3	75.3	56.3	111.9	60.3
1971	69.6	81.5	70.6	100.4	63.2
1972	79.7	87.0	77.1	103.7	70.9
1973	90.7	99.1	89.8	114.7	80.9
1974	89.8	90.1	77.5	111.3	85.7
1975	77.2	81.0	65.7	106.7	81.4
1976	86.8	92.2	86.5	101.7	89.4
1977	100.0	100.0	100.0	100.0	100.0
1978	112.9	106.3	104.6	108.7	111.5
1979	125.7	108.3	95.9	125.1	118.7
1980	130.3	96.9	71.1	132.0	122.0
1981	134.1	95.1	71.6	127.0	126.3
1982	128.4	87.6	66.8	115.7	125.3
1983	143.8	99.2	85.8	117.4	123.2
1984	172.4	113.6	105.6	124.4	136.9

r - Revised.

Source: Federal Reserve Board.

PRODUCTIVITY IN MANUFACTURING (r)
Indexes, 1947 to Date
1977 = 100

	Productivity (a) (Output Per Hour of All Persons)	Constant Dollar Output	Hours (All Persons)	Compensation Per Hour		Unit Labor Costs
				Current	Real (b)	
1947	42.4	33.9	79.9	17.5	47.6	41.3
1948	45.1	35.8	79.4	19.5	49.2	43.3
1949	46.9	33.9	72.4	20.4	51.9	43.5
1950	49.4	38.6	78.2	21.5	54.0	43.4
1951	51.1	43.0	84.2	23.6	55.1	46.2
1952	52.1	44.5	85.4	25.2	57.4	48.3
1953	52.9	47.5	89.8	26.5	60.1	50.1
1954	53.8	44.1	82.1	27.7	62.5	51.6
1955	56.4	48.9	86.6	28.8	65.1	51.0
1956	56.0	49.2	87.9	30.6	68.3	54.7
1957	57.2	49.5	86.5	32.5	69.9	56.8
1958	56.9	45.2	79.4	33.9	71.1	59.6
1959	59.6	50.5	84.6	35.2	73.2	59.0
1960	60.0	50.7	84.4	36.7	75.1	61.1
1961	61.6	50.7	82.3	37.7	76.4	61.1
1962	64.3	55.1	85.6	39.2	78.4	60.9
1963	68.9	59.6	86.5	40.3	79.8	58.5
1964	72.3	63.9	88.4	42.0	82.0	58.1
1965	74.6	69.8	93.6	42.8	82.3	57.5
1966	75.4	75.1	99.7	44.8	83.6	59.4
1967	75.3	75.0	99.5	47.0	85.3	62.4
1968	78.0	79.1	101.4	50.4	87.7	64.6
1969	79.3	81.7	103.0	53.9	89.1	67.9
1970	79.2	77.0	97.3	57.6	89.8	72.7
1971	84.0	78.7	93.7	61.1	91.4	72.7
1972	88.2	86.2	97.7	64.4	93.2	73.0
1973	93.0	95.9	103.1	69.0	94.1	74.2
1974	90.8	91.9	101.2	76.4	93.8	84.1
1975	93.4	85.4	91.4	85.5	96.2	91.5
1976	97.6	93.6	95.9	92.3	98.3	94.6
1977	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.9	105.3	104.4	108.3	100.6	107.3
1979	101.6	108.2	106.5	118.8	99.2	117.0
1980	101.7	103.5	101.7	132.7	97.6	130.5
1981	104.9	106.1	101.1	145.2	96.8	138.4
1982	107.1	99.3	92.7	158.0	99.2	147.6
1983	111.6	104.4	93.5	163.4	99.4	146.4
1984	115.6	115.3	99.8	169.4	98.8	146.5
1984						
1st Qtr.	114.0	112.8	98.9	167.1	98.8	146.6
2nd Qtr.	115.0	115.1	100.1	168.3	98.6	146.4
3rd Qtr.	117.0	117.0	100.0	169.9	98.7	145.2
4th Qtr.	116.3	116.5	100.2	172.1	99.1	147.9
1985						
1st Qtr.	116.5	116.8	100.2	174.5	99.6	149.8

r - Revised.

(a) The productivity index is obtained by dividing the constant dollar output index by the labor input (hours) index.

(b) Compensation per hour adjusted for changes in the Consumer Price Index.

Source: U.S. Bureau of Labor Statistics.

This table is based on output and compensation data published by the Commerce Department's Bureau of Economic Analysis. The indexes for manufacturing output, which are based on figures taken from Gross National Product components, vary from those for manufacturing production in the tables of industrial production indexes. The latter are generated independently by the Federal Reserve Board from their own survey and using their own methodology.

SELECTED LEADING BUSINESS CYCLE INDICATORS
1950 to Date

	Composite 12 Leading Indicators	Selected Leading Indicators					
		Average Workweek, Mfg.	Layoff Rate, Mfg.	New Orders Consumer Goods	Orders for Plant & Equipment	Net Change in Inventories	Change in Sensitive Prices
	1967 = 100	Hours	Per 100 Employees	$72 Billion	$72 Billion	$72 Billion Annual Rate	Percent
1950	56.3	40.5	1.3	$179.34	$ 52.79	$11.4	2.5%
1951	56.0	40.6	1.4	193.78	62.15	23.6	-0.5
1952	57.1	40.7	1.4	190.70	53.24	8.7	-0.8
1953	67.9	40.5	1.6	196.17	51.05	-0.2	-0.5
1954	58.6	39.6	2.3	183.12	42.62	-12.3	0.3
1955	66.6	40.7	1.5	234.96	58.15	6.7	0.5
1956	66.5	40.4	1.7	216.25	60.63	8.2	-0.1
1957	64.5	39.8	2.1	205.54	52.31	-4.8	-0.6
1958	65.7	39.2	2.6	194.74	47.04	-5.6	0.3
1959	73.1	40.3	2.0	227.48	55.32	12.4	0.3
1960	71.3	39.7	2.4	214.81	54.60	-3.6	-0.5
1961	75.2	39.8	2.2	225.44	55.49	1.8	0.1
1962	79.6	40.4	2.0	241.15	60.54	6.5	-0.2
1963	84.5	40.5	1.8	259.00	65.95	7.4	0.1
1964	90.6	40.7	1.7	280.39	74.89	11.6	0.5
1965	96.0	41.2	1.4	308.24	81.99	13.3	0.1
1966	99.0	41.4	1.2	327.93	94.63	20.9	-0.3
1967	100.0	40.6	1.4	323.14	87.23	9.4	-0.1
1968	107.2	40.7	1.2	346.36	115.03	9.8	0.5
1969	111.1	40.6	1.2	358.23	123.31	12.3	0.6
1970	105.5	39.8	1.8	327.13	105.32	0.2	-0.4
1971	113.5	39.9	1.6	343.15	109.87	4.0	0.4
1972	125.0	40.5	1.1	387.93	121.93	13.3	1.0
1973	132.2	40.7	0.9	432.04	148.99	25.2	2.3
1974	121.2	40.0	1.5	396.18	149.01	10.4	-0.1
1975	115.7	39.5	2.1	342.08	116.89	-17.3	-0.3
1976	130.9	40.1	1.3	391.14	132.21	7.9	1.1
1977	139.4	40.3	1.1	433.17	146.40	13.3	0.4
1978	145.8	40.4	0.9	458.31	172.55	20.4	1.3
1979	145.1	40.2	1.1	450.20	186.09	9.1	0.9
1980	138.2	39.7	1.7	399.98	171.94	-7.8	0.1
1981	140.9	39.8	1.5	398.51	168.81	1.3	-0.6
1982	136.8	38.9	NA	353.23	148.84	-14.4	-0.7
1983(r)	156.1	40.1	NA	409.54	160.79	1.9	1.0
1984(p)	165.7	40.7	NA	450.35	184.83	21.4	-0.2
1984 1st Qtr.(p)	166.1	40.8	NA	114.39	45.81	25.2	0.5
2nd Qtr.(p)	167.8	40.8	NA	112.37	47.50	32.4	0.1
3rd Qtr.(p)	164.7	40.5	NA	112.41	46.48	16.6	-0.9
4th Qtr.(p)	164.3	40.5	NA	111.18	45.04	11.4	-0.5
1985 1st Qtr.(a,p)	167.0	40.3	NA	78.03	31.49	2.6(b)	-0.7

NA - Not Availalbe. p - Preliminary. r - Revised.

(a) Includes data for January and February.
(b) January preliminary data only.

Note: New orders, plant and equipment orders, and change in inventory data are based in 1972 dollars.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, "Business Conditions Digest" (monthly).

Twelve economic indicators normally precede changes in the business year. These are the "leading indicators", six of which are shown separately in the table together with the composite of the 12.

BUSINESS CYCLE REFERENCE DATES
1854 to Date

Trough	Peak	Expansion Duration (in Months) (a)
Dec. 1854	June 1857	30
Dec. 1858	Oct. 1860	22
June 1861	Apr. 1865	46(b)
Dec. 1867	June 1869	18
Dec. 1870	Oct. 1873	34
Mar. 1879	Mar. 1882	36
May 1885	Mar. 1887	22
Apr. 1888	July 1890	27
May 1891	Jan. 1893	20
June 1894	Dec. 1895	18
June 1897	June 1899	24
Dec. 1900	Sept. 1902	21
Aug. 1904	May 1907	33
June 1908	Jan. 1910	19
Jan. 1912	Jan. 1913	12
Dec. 1914	Aug. 1918	44(b)
Mar. 1919	Jan. 1920	10
July 1921	May 1923	22
July 1924	Oct. 1926	27
Nov. 1927	Aug. 1929	21
Mar. 1933	May 1937	50
June 1938	Feb. 1945	80(b)
Oct. 1945	Nov. 1948	37
Oct. 1949	July 1953	45(b)
May 1954	Aug. 1957	39
Apr. 1958	Apr. 1960	24
Feb. 1961	Dec. 1969	106(b)
Nov. 1970	Nov. 1973	36
Mar. 1975	Jan. 1980	58
July 1980	July 1981	12
Nov. 1982		
Average Peacetime Cycles:		
25 cycles, 1854-1981		27
11 cycles, 1919-1981		31
6 cycles, 1945-1981		34

(a) Time period from trough to peak.

(b) Wartime expansions (Civil War, World War I and II, Korean War and Vietnam War.)

Source: National Bureau of Economic Research, Inc.

The historical business cycle turning dates, above, are those designated by the National Bureau of Economic Research, Inc. (NBER). They mark the approximate dates when, according to the NBER, aggregate economic activity reached its cyclical high (peak) or low (trough) levels.

MANUFACTURERS' INVENTORIES
Major Industry Groups, 1969 to Date
(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Total Manufacturing	Durables	By Industry Group: Primary Metals	By Industry Group: Fabricated Metal Products	By Capital Goods Industries: Nondefense	By Capital Goods Industries: Defense
1969	$ 98.2	$ 64.7	$ 8.1	$ 7.6	$22.6	$ 7.6
1970	101.7	66.8	9.0	7.8	24.6	4.9
1971	102.7	66.3	9.1	8.0	24.2	4.0
1972	108.2	70.3	9.6	8.5	25.3	4.3
1973	124.6	81.4	10.0	9.9	29.8	4.5
1974	157.8	101.7	13.4	13.4	37.5	4.9
1975	159.9	102.9	15.7	13.1	37.1	5.7
1976	175.2	112.6	17.6	14.4	37.7	6.5
1977	189.2	121.6	18.2	15.6	41.6	6.1
1978(r)	210.5	137.9	19.4	17.3	49.4	6.4
1979(r)	241.1	160.5	22.4	19.2	60.0	8.4
1980(r)	264.3	174.6	23.0	19.6	68.5	10.7
1981(r)	282.6	186.3	25.8	20.3	73.0	13.4
1982(r)	264.9	175.1	21.6	17.7	70.2	16.0
1983(r)	260.7	171.6	19.4	17.8	65.4	17.8
1984	285.7	191.1	20.6	19.3	72.3	22.5

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1978-1984" and Series M3-1 (monthly).

MANUFACTURERS' INVENTORIES
Selected Industry Groups, 1969 to Date
(Book Value in Billions of Dollars, Seasonally Adjusted)

As of Dec. 31	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products
1969	$13.3	$ 9.6	$ 4.1	$11.8	$2.7
1970	14.4	9.8	4.2	10.4	2.9
1971	14.2	9.4	4.2	9.6	3.0
1972	15.1	9.9	4.7	10.1	3.2
1973	18.4	12.1	5.8	10.7	3.8
1974	24.1	14.0	6.7	12.5	4.9
1975	24.1	13.0	6.1	13.5	4.8
1976	25.3	14.5	8.0	13.1	5.4
1977	27.3	16.4	9.2	13.3	6.0
1978(r)	31.7	18.9	10.3	15.8	6.9
1979	37.1	23.0	10.9	20.7	7.9
1980(r)	40.7	25.9	9.9	26.1	9.1
1981(r)	43.5	28.4	9.1	28.5	9.7
1982	40.1	26.6	8.3	32.1	9.2
1983(r)	36.8	28.2	9.4	31.0	9.0
1984	40.7	32.8	11.2	36.2	9.4

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1978-1984" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS

Major Industry Groups, 1969 to Date

(Billions of Dollars)

			By Industry Group		By Capital Goods Industries	
Year	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1969	$ 647.6	$ 358.6	$ 54.9	$ 47.7	$ 92.9	$24.5
1970	624.8	329.0	51.8	44.4	81.6	21.5
1971	671.9	360.1	51.3	44.4	90.2	19.0
1972	770.0	420.8	61.4	52.9	103.5	20.8
1973	9[illegible]5.1	515.2	80.8	64.8	131.7	23.7
1974	1,0[illegible].2	562.2	99.0	74.4	152.1	25.7
1975	1,021.8	504.2	74.1	64.4	132.1	24.8
1976	1,194.5	616.8	94.5	76.2	153.6	31.1
1977	1,380.4	733.0	105.5	91.5	183.5	35.2
1978	1,578.6	868.1	124.6	104.6	233.5	41.8
1979	1,768.8	953.4	139.6	116.6	278.8	34.1
1980	1,873.9	952.3	134.1	115.3	279.1	58.7
1981(r)	2,013.0	1,002.6	137.0	122.4	288.6	59.1
1982(r)	1,887.1	899.9	101.0	106.8	248.2	75.4
1983(r)	2,079.1	1,051.6	123.4	119.5	273.2	81.6
1984	2,299.6	1,207.3	129.3	140.3	324.2	89.7

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1978-1984" and Series M3-1 (monthly).

MANUFACTURERS' UNFILLED ORDERS

Major Industry Groups, 1969 to Date

(Billions of Dollars, Seasonally Adjusted)

			By Industry Group		By Capital Goods Industries	
As of Dec. 31	Total Manufacturing	Durables	Primary Metals	Fabricated Metal Products	Nondefense	Defense
1969	$115.1	$111.0	$ 7.9	$15.0	$ 53.9	$ 22.4
1970	105.9	101.3	7.7	14.9	47.8	20.2
1971	106.8	101.7	7.4	13.5	49.4	19.6
1972	121.1	114.7	10.3	15.1	54.6	19.7
1973	161.3	153.9	18.5	21.1	70.5	22.0
1974	191.1	185.6	21.9	28.2	86.8	26.3
1975	173.8	165.9	15.1	24.1	79.4	28.1
1976	182.5	174.2	16.8	23.0	81.7	32.0
1977	203.5	195.0	17.2	24.5	90.9	37.2
1978(r)	259.8	249.5	23.9	27.8	117.0	47.7
1979(r)	302.1	290.9	26.1	30.9	149.2	49.0
1980(r)	323.4	312.6	26.3	30.1	156.0	67.1
1981(r)	319.1	309.1	21.4	28.9	146.9	78.1
1982(r)	296.9	287.8	15.2	21.6	123.3	96.6
1983(r)	330.9	320.1	20.9	20.5	124.1	112.8
1984	355.6	345.4	19.1	21.7	133.9	129.8

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1978-1984" and Series M3-1 (monthly).

MANUFACTURERS' NET NEW ORDERS

Selected Industry Groups, 1969 to Date

(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1969	$ 59.4	$ 48.0	$24.7	$ 59.2	$1.7
1970	54.9	47.0	17.4	50.0	.9
1971	56.1	48.5	22.5	67.4	.9
1972	70.9	54.1	21.0	75.5	1.4
1973	89.2	64.7	26.7	91.5	2.6
1974	105.3	67.8	29.9	84.1	2.6
1975	92.7	62.8	26.9	82.2	1.3
1976	107.4	77.0	31.9	111.7	2.2
1977	126.7	92.5	40.8	134.1	3.0
1978	154.5	106.8	54.9	158.2	4.3
1979	174.6	121.6	68.3	154.2	5.6
1980	180.6	135.6	73.1	129.0	4.8
1981	200.5	144.7	64.1	139.6	2.9
1982	162.9	147.6	67.7	132.9	1.5
1983	180.9	165.6	81.9	172.1	1.7
1984	213.0	191.3	93.2	208.3	2.9

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1978-1984" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

MANUFACTURERS' UNFILLED ORDERS

Selected Industry Groups, 1969 to Date

(Billions of Dollars, Seasonally Adjusted)

Year	Nonelectrical Machinery	Electrical Machinery	Aircraft and Parts	Other Transportation Equipment	Machine Tools
1969	$23.7	$16.8	$ 33.4	$ 8.7	$1.2
1970	22.1	16.6	26.3	8.6	.7
1971	22.2	17.2	26.4	9.6	.6
1972	27.5	18.0	26.2	11.5	1.0
1973	38.9	22.0	27.8	17.4	2.1
1974	51.9	24.0	30.4	20.6	2.6
1975	48.9	22.7	28.1	18.4	1.5
1976	50.8	25.9	28.9	19.6	1.6
1977	55.4	30.1	37.3	19.1	2.3
1978(r)	66.8	36.5	54.8	26.0	3.6
1979(r)	75.0	42.2	75.1	27.0	5.4
1980(r)	74.8	49.3	89.7	27.9	5.5
1981(r)	73.8	53.8	89.1	27.0	3.3
1982(r)	55.8	60.3	93.1	28.2	1.2
1983(r)	58.4	70.1	103.8	30.6	1.0
1984	61.3	78.9	119.9	27.7	1.7

r - Revised.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1978-1984" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1969 to Date
(Billions of Dollars)

Year	Total Manufacturing	Durables	By Industry Group: Primary Metals	By Industry Group: Fabricated Metal Products	By Capital Goods Industries: Nondefense	By Capital Goods Industries: Defense
1969	$ 642.5	$ 353.7	$ 53.5	$ 46.6	$ 88.5	$26.5
1970	634.0	338.6	52.0	44.5	87.5	23.6
1971	671.1	359.7	51.6	45.7	88.5	19.7
1972	756.3	408.3	58.4	51.5	97.9	20.2
1973	875.2	476.2	72.7	58.9	115.8	21.4
1974	1,017.5	530.7	95.6	67.3	135.9	21.3
1975	1,039.1	523.9	80.8	68.5	139.6	23.0
1976	1,185.6	608.3	93.0	77.4	151.4	26.7
1977	1,358.4	711.2	103.2	90.0	174.5	30.1
1978	1,522.9	814.2	118.1	101.3	207.6	31.2
1979	1,727.2	912.7	137.4	113.6	247.1	32.9
1980	1,852.7	930.6	133.9	116.2	272.4	40.6
1981	2,017.5	1,006.5	141.9	123.7	297.7	48.2
1982(r)	1,908.3	920.3	107.0	114.0	271.3	56.7
1983(r)	2,045.3	1,019.4	117.9	120.6	272.3	65.2
1984	2,274.9	1,182.0	131.2	139.2	314.5	72.5

r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1978-1984" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Shipments, and Backlog" (monthly).

MANUFACTURERS' SHIPMENTS
Major Industry Groups, 1969 to Date
(Billions of Dollars)

Year	Nonelectrical Machinery	Electrical Machinery	Motor Vehicles and Parts	Other Transportation Equipment	Instruments and Related Products	Machine Tools
1969	$ 56.1	$ 47.6	$ 50.9	$34.2	$13.1	$1.6
1970	56.5	47.2	42.5	32.0	13.1	1.4
1971	56.0	48.0	58.2	30.6	13.5	1.0
1972	65.8	53.4	63.9	30.8	15.5	1.0
1973	77.8	60.9	74.8	35.8	17.9	1.5
1974	92.5	65.8	68.6	39.6	21.0	2.0
1975	95.8	64.2	70.0	43.5	22.1	2.5
1976	105.5	73.9	95.4	45.6	25.0	2.1
1977	122.2	88.4	117.7	49.2	28.9	2.3
1978	143.2	100.5	132.0	56.8	33.7	3.0
1979	166.5	116.0	131.4	70.2	37.7	3.9
1980	180.7	128.6	104.6	82.0	44.1	4.7
1981	201.5	140.2	117.0	88.2	48.3	5.1
1982(r)	180.6	141.1	112.2	82.9	46.9	3.6
1983(r)	178.3	156.0	151.9	88.6	47.9	1.8
1984	210.2	182.5	191.5	96.8	53.5	2.3

r - Revised.

Source: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories, and Orders: 1978-1984" and Series M3-1 (monthly); NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

SHIPMENTS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1979 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1979	1980	1981	1982	1983	1984
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$ 654	$ 822	$ 885	$ 916	$ 638	$ 692
Feb.	811	994	1,091	953	645	789
Mar.	906	1,087	1,150	987	670	876
Apr.	773	898	1,018	817	618	814
May	809	933	971	789	623	824
June	924	1,077	1,114	888	642	855
July	746	763	860	719	563	726
Aug.	792	835	930	764	640	775
Sept.	938	1,009	1,115	772	773	917
Oct.	918	1,021	1,029	681	759	943
Nov.	894	1,002	912	659	713	807
Dec.	908	1,077	943	676	731	959
TOTAL	$10,073	$11,518	$12,018	$9,621	$8,015	$9,977
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	$ 245	$ 331	$ 389	$ 384	$ 153	$ 113
Feb.	280	355	422	360	158	147
Mar.	333	460	477	411	176	189
Apr.	305	343	448	303	151	159
May	323	375	411	296	136	210
June	351	476	509	409	183	204
July	268	327	367	250	112	194
Aug.	285	311	325	257	113	164
Sept.	347	411	442	276	132	211
Oct.	380	440	407	201	145	208
Nov.	361	400	408	194	148	212
Dec.	399	463	491	264	238	276
TOTAL	$3,877	$4,692	$5,096	$3,604	$1,845	$2,286

(a) Adjusted for trading-day and calendar month variation.

(b) Shipments of new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1978-84" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The cyclical nature of the machine tool industry is apparent in both new orders and shipment figures. Shipments totaled almost $2.5 billion by 1975, dropped by 16% in 1976, and grew to almost $5.1 billion in 1981. In 1982 shipments fell 29% and declined another 49% to $1.8 billion in 1983. In 1984 shipments rose 24% to $2.3 billion.

NET NEW ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1979 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1979	1980	1981	1982	1983	1984
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$ 820	$ 1,056	$ 898	$ 681	$ 498	$ 798
Feb.	1,002	1,210	948	602	608	884
Mar.	1,099	1,282	1,059	597	602	910
Apr.	1,001	921	880	541	610	862
May	978	860	742	562	653	943
June	1,003	1,064	891	755	681	905
July	970	764	648	529	626	1,123
Aug.	1,005	664	807	640	764	955
Sept.	1,278	943	781	525	728	1,018
Oct.	1,096	900	790	566	835	897
Nov.	1,049	806	648	523	751	877
Dec.	940	970	475	538	637	1,074
TOTAL	$12,241	$11,440	$9,567	$7,059	$7,993	$11,246
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	—	—	$ 291	$ 205	$ 92	$ 189
Feb.	—	—	280	164	98	203
Mar.	$ 1,471	$ 1,517	350	138	126	208
Apr.	—	—	320	151	119	253
May	—	—	229	106	135	320
June	1,356	1,335	318	126	145	192
July	—	—	192	107	175	313
Aug.	—	—	214	87	137	201
Sept.	1,353	818	187	87	156	286
Oct.	—	—	216	119	203	284
Nov.	—	—	196	88	160	212
Dec.	1,440	984	152	121	151	255
TOTAL	$ 5,621	$ 4,754	$2,945	$1,498	$1,696	$2,916

(a) Adjusted for trading-day and calendar month variation.

(b) Net new orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1978-84" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

The most dramatic indicator of the cyclical nature of the machine tool business is new orders. These generally follow the overall movement of the economy but the cycles involved are much more pronounced. For example, in 1975 new orders were only 45% of the level experienced in 1973. However, the economic recovery following the 1974 recession was especially strong in the machine tool sector and by 1979 orders were running at record levels, well in excess of $5 billion per year. This strength in machine tool orders continued into early 1980, and then began a long, steady decline until late 1982. As a mark of the severity of the recession, machine tool orders for 1982 were only 27% of their 1979 record total. Monthly order placements demonstrated gradual improvement throughout 1983, but still ended up only 13% ahead of 1982. However, in 1984 there was a dramatic increase of 72% to $2.9 billion, but the failure of the industry to experience a recovery in step with the general economy has threatened the future of many domestic machine tool building firms.

UNFILLED ORDERS: METALWORKING MACHINERY AND MACHINE TOOLS

Monthly, 1979 to Date

(Millions of Dollars, Not Seasonally Adjusted)

Month	1979	1980	1981	1982	1983	1984
Metalworking Machinery Industry (SIC 354) (a)						
Jan.	$5,485	$7,721	$7,422	$4,723	$2,256	$2,480
Feb.	5,676	7,937	7,279	4,372	2,219	2,575
Mar.	5,869	8,132	7,188	3,982	2,151	2,609
Apr.	6,097	8,155	7,050	3,706	2,143	2,657
May	6,266	8,082	6,821	3,479	2,173	2,776
June	6,345	8,069	6,598	3,346	2,212	2,826
July	6,569	8,070	6,386	3,156	2,275	3,223
Aug.	6,782	7,899	6,263	3,032	2,399	3,403
Sept.	7,122	7,833	5,929	2,785	2,354	3,504
Oct.	7,300	7,712	5,690	2,670	2,430	3,458
Nov.	7,455	7,516	5,426	2,534	2,468	3,528
Dec.	7,487	7,409	4,958	2,396	2,374	3,643
Machine Tools (SIC 3541 & 3542) (b)						
Jan.	—	—	$5,353	$3,122	$1,133	$1,121
Feb.	—	—	5,211	2,926	1,072	1,176
Mar.	$4,257	$5,760	5,083	2,653	1,021	1,196
Apr.	—	—	4,956	2,500	989	1,290
May	—	—	4,773	2,310	988	1,400
June	4,635	5,902	4,583	2,027	950	1,388
July	—	—	4,408	1,883	1,013	1,507
Aug.	—	—	4,296	1,713	1,037	1,544
Sept.	5,089	5,770	4,042	1,524	1,062	1,619
Oct.	—	—	3,852	1,442	1,119	1,695
Nov.	—	—	3,639	1,337	1,131	1,695
Dec.	5,388	5,451	3,300	1,194	1,045	1,675

(a) Adjusted for trading-day and calendar month variation.

(b) Unfilled orders for new machine tools and accessories ordered with them.

Sources: U.S. Bureau of the Census, "Manufacturers' Shipments, Inventories and Orders: 1978-84" and Series M3-1 (monthly). NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

Because they must incorporate a variety of customer-specified options, machine tools are generally "built to order" rather than being built for inventory. This order-taking procedure results in the backlog of unfilled orders, machines ordered by customers but not yet shipped, for which statistics appear above. The backlog of unfilled orders for machine tools, which had increased continuously for four years, peaked in mid-1980 at just over $5.6 billion. The slack pace of the economy since then saw the accumulated volume of unfilled orders drop to just $1.0 billion by the end of 1983. The order recovery in 1984 led to a sharp increase for the year but total outstanding unfilled order levels were nonetheless in line with prevailing shipping rates.

PRODUCER PRICE INDEXES

For Selected Machine Tool Materials and Components

1967 = 100, unless otherwise indicated

Commodity	1976	1977	1978	1979	1980	1981	1982	1983	1984
Finished Goods	170.3	180.6	194.6	216.1	247.0	269.8	280.7	285.2	291.2
All Commodities	182.9	194.2	209.3	235.6	268.8	293.4	299.3	303.1	310.3
Industrial Commodities	182.3	195.1	209.4	236.5	274.8	304.1	312.3	315.7	322.6
Manufactured Durables	175.5	186.1	204.7	226.1	250.8	269.7	279.8	287.3	293.9
Industrial Power, 500 KW Demand	226.9	257.0	279.5	305.3	368.1	422.2	473.1	487.8	513.1
Lubricating Oil Materials	265.1	304.3	349.5	477.9	756.4	873.6	877.2	787.5	796.5
Prepared Paint	174.2	182.4	192.3	204.4	235.3	249.8	262.8	264.7	272.6
Iron and Steel	215.8	230.4	253.6	283.5	305.2	333.8	339.0	343.4	356.9
Steel Mill Products	209.7	229.9	254.5	280.4	302.7	337.6	349.5	352.8	366.0
Semi-finished Steel Products	223.0	243.6	270.5	294.3	325.6	359.3	370.2	370.6	371.5
Finished Steel Products	208.9	229.0	253.5	279.5	301.2	336.2	348.0	349.9	363.0
Foundry and Forge Shop Products	218.3	230.5	249.5	277.1	310.0	329.8	345.5	351.1	360.5
Gray Iron Castings	199.7	211.1	225.1	245.5	270.7	NA	NA	NA	NA
Steel Castings	216.3	234.4	257.3	291.9	327.8	NA	NA	NA	NA
Gray & Ductile Iron Cast Dec. 1980 = 100	NA	NA	NA	NA	NA	105.2	110.5	110.5	111.6
Nonferrous Metals	181.5	195.4	207.8	261.7	305.0	285.8	263.6	276.1	276.9
Primary Metal Refinery Shapes	191.6	206.0	218.3	295.4	377.2	326.1	284.3	303.7	288.0
Mill Shapes	194.1	213.1	229.9	270.4	292.7	304.1	301.5	310.8	321.4
Aluminum Shapes	176.8	202.1	226.5	247.3	266.7	293.4	298.5	305.2	334.1
Wire and Cable	151.3	156.1	155.2	186.5	217.6	207.5	202.5	204.0	202.2
Metalworking Machinery and Equipment	182.7	198.5	217.0	241.3	274.4	301.3	320.9	326.5	333.9
Cutting Tools & Access.	153.9	172.0	187.5	206.8	233.2	256.3	271.1	274.7	279.3
Abrasive Products	177.8	193.4	205.6	223.4	252.5	276.5	296.8	304.5	307.7
Metal Cutting Machine Tools	190.9	206.3	231.5	266.9	313.5	344.8	368.5	376.3	385.7
Metal Forming Machine Tools	212.9	232.6	262.8	300.1	346.7	380.3	404.7	415.8	423.8
General Purpose Machy. & Equipment	189.7	201.8	216.6	236.4	264.6	288.7	304.0	308.2	314.1
Pumps, Compressors, & Equipment	197.9	211.6	228.0	249.1	287.7	324.5	347.3	347.4	349.4
Fluid Power Equipment, Dec. 1970 = 100	143.8	152.7	163.3	176.2	199.6	222.3	244.3	252.9	258.9
Fluid Power Pumps, Dec. 1970 = 100	143.0	152.0	161.7	174.9	198.6	223.9	245.1	257.2	255.0
Fluid Power Valves, Dec. 1971 = 100	134.2	142.6	150.3	162.1	180.5	200.1	222.4	226.0	234.8
Cylinders, Dec. 1971 = 100	142.3	151.1	164.3	177.7	205.5	230.1	255.9	273.0	NA
Cylinders, June 1984 = 100	NA	NA	NA	NA	NA	NA	NA	NA	100.2
Fluid Power Hose and Tube Fittings,Dec. 1972 = 100	143.3	151.3	166.5	178.0	204.3	223.5	238.4	239.5	244.4
Mechanical Power Transmission Equipment	185.1	196.6	213.0	234.6	264.0	294.8	312.4	315.8	326.1
Miscellaneous General Purpose Equipment	195.6	206.9	222.7	246.4	279.4	307.0	323.5	325.0	334.5
Ball & Roller Bearings	176.4	191.4	206.3	227.0	265.1	304.8	331.5	331.7	341.2
Electrical Machinery and Equipment	146.6	154.1	164.9	178.9	201.7	220.2	231.6	240.1	248.5
Motors, Generators, Motor Generator Sets	193.0	202.2	218.1	234.6	266.3	296.1	309.8	329.5	340.1
Electric Motors	179.2	192.5	207.3	229.0	252.3	278.8	293.9	NA	NA
Integral Elec. Motors, AC June 1983 = 100	NA	NA	NA	NA	NA	NA	NA	106.9	109.3
Transformers and Power Regulators	138.4	146.5	155.2	164.3	182.7	208.8	221.7	223.3	227.2
Switchgear, Switchboard, etc. Equipment	161.9	173.9	184.0	200.0	233.0	250.8	263.8	272.4	275.7
Electronic Components and Accessories	115.4	119.5	126.9	135.8	156.3	168.1	176.1	183.6	192.9

NA - Not Available.

Note: The individual commodities shown are selected components of each major commodity grouping. All indexes are annual averages.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

NATIONAL DEFENSE PURCHASES
IMPLICIT PRICE DEFLATORS
By Major Type of Product, 1974 to Date

(Index 1972 = 100)

Year	Total Purchases	Durables Goods	Non-Durable Goods	Services (a)	Structures	Compensation
1974	115.1	104.6	170.4	116.3	126.5	113.0
1975	124.9	114.9	190.9	130.7	138.5	120.9
1976	132.4	124.2	205.8	141.0	144.3	126.9
1977	141.9	135.4	225.6	154.2	150.5	134.0
1978	152.7	148.2	243.4	165.0	160.9	143.1
1979	166.0	164.3	298.1	177.1	183.5	152.2
1980	187.5	184.0	437.8	196.7	205.0	165.2
1981(r)	209.1	206.2	491.8	216.8	218.6	184.7
1982(r)	227.0	228.6	483.8	233.7	220.4	201.6
1983(r)	236.6	243.7	426.7	244.7	224.7	211.5
1984(p)	247.2	257.7	417.5	253.0	235.0	222.5

r - Revised. p - Preliminary.

(a) Services excluding compensation.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

NATIONAL DEFENSE PURCHASES
By Major Type of Product, 1974 to Date

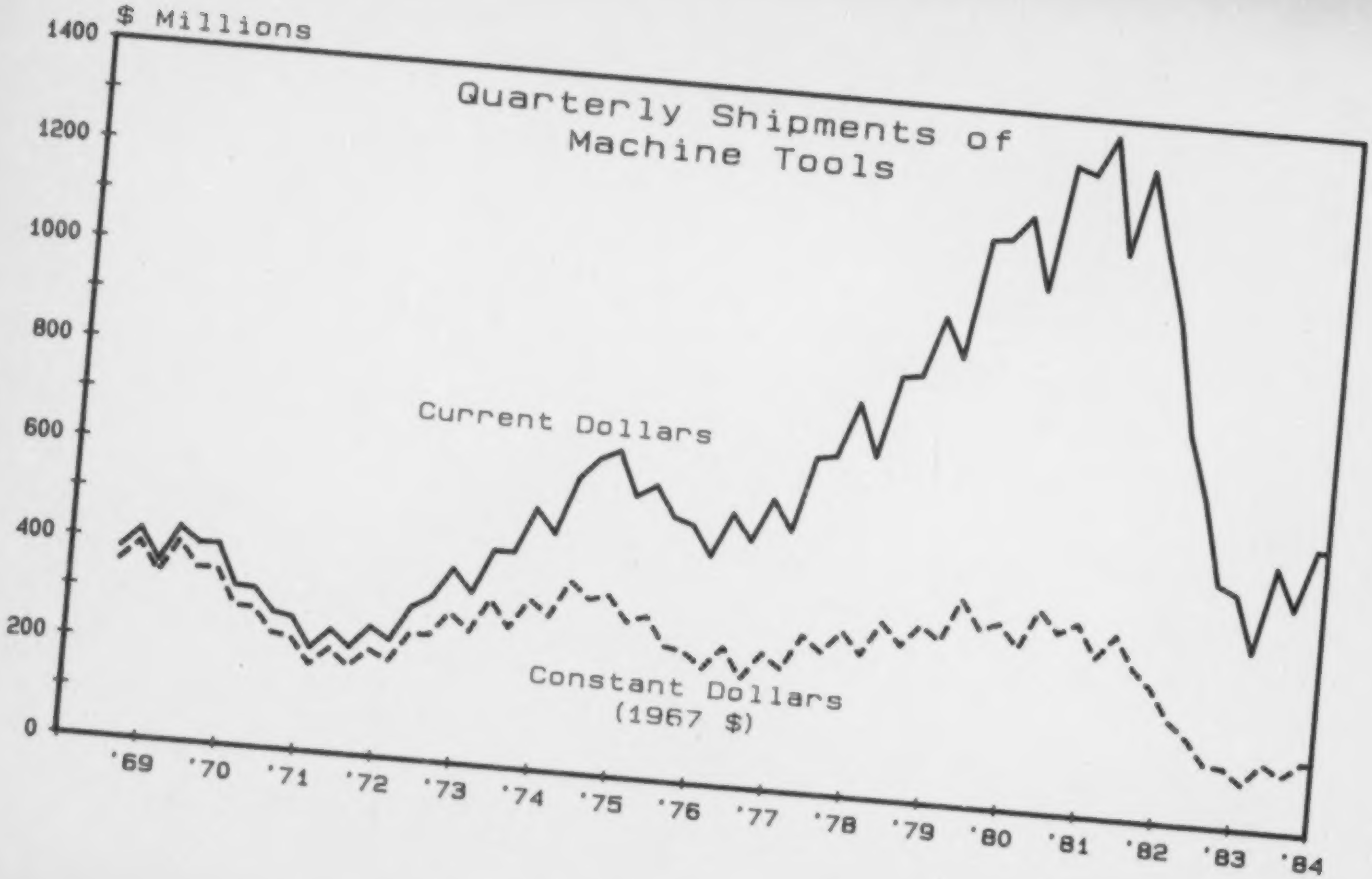
Year	Total Purchases	Durable Goods	Non-Durable Goods	Services (a)	Structures	Compensation
In Current Dollars (Billions)						
1974	$ 77.0	$14.3	$ 5.4	$17.3	$2.3	$37.7
1975	83.0	17.6	5.3	17.8	2.5	39.8
1976	86.0	18.6	4.7	19.5	2.3	40.9
1977	92.8	22.3	5.0	20.3	2.4	42.8
1978	100.3	24.1	5.5	22.1	2.5	46.1
1979	111.8	29.0	6.6	25.1	2.5	48.7
1980	131.2	33.5	10.7	30.7	3.2	53.1
1981(r)	153.7	40.0	12.5	36.8	3.2	61.2
1982(r)	179.5	49.4	13.3	44.5	3.9	68.4
1983(r)	200.5	59.1	12.4	51.3	4.6	73.1
1984(p)	221.5	69.3	11.6	57.7	4.9	77.9
In Constant 1972 Dollars (Billions)						
1974	$66.9	$13.7	$3.2	$14.9	$1.8	$33.3
1975	66.4	15.4	2.8	13.6	1.8	32.9
1976	64.9	15.0	2.3	13.8	1.6	32.3
1977	65.4	16.5	2.2	13.2	1.5	32.0
1978	65.7	16.2	2.2	13.4	1.6	32.2
1979	67.4	17.7	2.2	14.2	1.4	32.0
1980	70.0	18.2	2.4	15.6	1.5	32.2
1981(r)	73.5	19.4	2.5	17.0	1.5	33.1
1982(r)	79.1	21.6	2.8	19.0	1.8	33.9
1983(r)	84.7	24.2	2.9	21.0	2.0	34.6
1984(p)	89.6	26.9	2.8	22.8	2.1	35.0

p - Preliminary. r - Revised.

(a) Services excluding compensation.

Source: U.S. Department of Commerce, "Survey of Current Business" (monthly).

The estimates in the above tables are from a report prepared by the Bureau of Economic Analysis (BEA). Prior to 1980, the BEA included only Department of Defense purchases in the defense spending series. Beginning in 1980, their statistics include defense activities of other Federal agencies as well. These tables have been revised to reflect that change.


Quarterly Shipments of Machine Tools

PRODUCER PRICE INDEXES FOR MACHINE TOOLS
1948 to Date
1967 = 100

Year	All Commodities	Durable Manufactures	Total (a) Machine Tools	Metal Cutting Machine Tools	Metal Forming Machine Tools
1948	82.8	65.3	39.9	38.8	43.1
1949	78.7	67.3	47.2	41.2	45.1
1950	81.8	69.6	45.5	44.2	49.0
1951	91.1	76.3	52.7	51.6	55.7
1952	88.6	76.7	56.1	55.3	58.5
1953	87.4	78.4	56.9	55.8	59.8
1954	87.6	79.4	57.2	56.1	60.4
1955	87.8	82.2	60.1	58.3	65.2
1956	90.7	87.5	68.1	66.3	73.7
1957	93.3	90.9	72.8	71.3	77.8
1958	94.6	92.1	74.0	72.7	76.9
1959	94.8	94.0	75.2	74.3	77.5
1960	94.9	94.1	77.4	76.5	79.6
1961	94.5	93.6	79.0	78.8	79.5
1962	94.8	93.5	80.8	80.5	81.4
1963	94.5	93.6	81.1	80.8	81.9
1964	94.7	94.6	84.1	83.9	84.4
1965	96.6	95.8	88.6	88.3	89.3
1966	99.8	97.9	94.4	94.1	95.6
1967	100.0	100.0	100.0	100.0	100.0
1968	102.5	103.5	103.3	103.0	104.1
1969	106.5	107.7	107.1	106.8	107.4
1970	110.4	112.0	114.1	113.5	115.6
1971	113.9	117.0	118.2	117.1	121.0
1972	119.1	121.1	121.7	120.2	125.3
1973	134.7	127.4	129.6	128.2	133.0
1974	160.1	148.6	153.9	152.0	161.7
1975	174.9	165.6	180.5	177.1	192.2
1976	182.9	175.5	196.5	190.9	212.9
1977	194.2	188.0	213.3	206.3	232.6
1978	209.3	204.7	238.5	231.5	262.8
1979	235.6	226.1	273.2	266.9	300.1
1980	268.8	250.8	319.0	313.5	346.7
1981	293.4	269.7	353.4	344.8	380.3
1982	299.3	279.8	379.0	368.5	404.7
1983	303.1	287.3	389.0	376.3	415.8
1984	310.3	293.9	398.8	385.7	423.8

(a) Constructed by NMTBA from BLS producer price indexes for metal cutting and metal forming machine tools using NMTBA net new order weights.

Source: U.S. Dept. of Labor, Bureau of Labor Statistics: U.S. Dept. of Commerce, "Business Statistics, 1977," "Survey of Current Business" (monthly), and NMTBA.

Because of the continuous technological improvement in machine tools and the increasing number of "custom built" machines, reliable wholesale price indexes (which are intended to measure price changes not influenced by changes in quality, product mix, etc.) are difficult to develop. The data should be used with caution.

SHIPMENTS OF MACHINE TOOLS AT CONSTANT PRICES

1947 to Date

(in 1984 Dollars)

	Total Industry(a)		Metal Cutting		Metal Forming (a)	
Year	Current Dollars (Thousands)	1984 Dollars (Thousands)	Current Dollars (Thousands)	1984 Dollars (Thousands)	Current Dollars (Thousands)	1984 Dollars (Thousands)
1947	$ 306,000	$3,418,231	$ 306,000	$3,440,909	—	—
1948	288,450	2,867,296	288,450	2,867,296	—	—
1949	249,150	2,332,428	249,150	2,332,428	—	—
1950	305,550	2,666,230	305,550	2,666,230	—	—
1951	632,250	4,726,043	632,250	4,726,043	—	—
1952	1,125,900	7,852,560	1,125,900	7,852,560	—	—
1953	1,191,200	8,233,912	1,191,200	8,233,912	—	—
1954	891,750	6,130,973	891,750	6,130,973	—	—
1955	670,400	4,435,329	670,400	4,435,329	—	—
1956	1,377,300	8,065,706	945,200	5,498,546	$ 432,100	$2,484,761
1957	1,242,700	6,807,450	900,150	4,869,361	342,550	1,865,944
1958	591,200	3,186,031	438,400	2,325,853	152,800	842,105
1959	616,000	3,266,691	440,600	2,287,168	175,400	959,151
1960	744,000	3,833,471	541,500	2,730,160	202,500	1,078,160
1961	750,900	3,790,701	541,250	2,649,290	209,650	1,117,597
1962	821,250	4,053,354	612,850	2,936,371	208,400	1,085,021
1963	895,750	4,404,750	638,450	3,047,649	257,300	1,331,436
1964	1,164,350	5,521,387	844,650	3,882,913	319,700	1,605,323
1965	1,425,600	6,416,708	1,022,550	4,466,649	403,050	1,912,819
1966	1,685,200	7,119,260	1,221,750	5,007,788	463,450	2,054,482
1967	1,805,950	7,202,193	1,353,200	5,219,269	452,750	1,918,757
1968	1,726,900	6,666,795	1,358,300	5,086,313	368,600	1,500,631
1969	1,597,550	5,948,578	1,192,450	4,306,428	405,100	1,598,532
1970	1,443,050	5,043,689	992,900	3,374,112	450,150	1,650,291
1971	997,900	3,366,848	672,300	2,214,427	325,600	1,140,415
1972	1,018,700	3,338,139	714,450	2,292,549	304,250	1,029,054
1973	1,501,000	4,618,888	1,073,750	3,230,489	427,250	1,361,406
1974	2,030,550	5,261,719	1,445,850	3,668,832	584,700	1,532,433
1975	2,451,700	5,416,805	1,878,650	4,091,404	573,050	1,263,561
1976	2,059,650	4,180,078	1,482,100	2,994,504	577,550	1,149,674
1977	2,280,750	4,264,280	1,650,800	3,086,357	629,950	1,147,784
1978	3,013,450	5,038,877	2,188,500	3,646,224	824,950	1,330,350
1979	3,876,550	5,658,701	2,930,050	4,234,237	946,500	1,336,638
1980	4,691,750	5,865,421	3,680,800	4,528,488	1,010,950	1,235,774
1981	5,095,600	5,750,203	4,104,500	4,591,369	991,100	1,104,462
1982	3,604,400	3,792,708	2,894,750	3,029,851	709,650	743,143
1983	1,845,050	1,891,525	1,371,500	1,405,758	473,550	482,663
1984	2,285,850	2,285,850	1,606,500	1,606,500	679,350	679,350

(a) Shipment data not available for metal forming prior to 1956.

Note: 1984 dollar values developed from the Producer Price index (formerly Wholesale Price Index) for metal cutting and metal forming machine tools.

Source: U.S. Department of Labor, Bureau of Labor Statistics, NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

When converted to constant dollars, the apparent record shipments in recent years disappear. For the years shown above, the historical constant dollar average for metal cutting is $3,815,646 and for metal forming is $1,329,025.

2

WORLD ECONOMY

The tables in this chapter are intended to provide a perspective of the U.S. position in the world economy. The picture has changed dramatically in the past twenty years. The changes in the world's economic structure brought about by OPEC and the growth of many developing nations into newly industrialized powers have led to major shifts in the balance of economic power in the world. The rise to wealth of these developing nations has been accompanied by a substantial increase in world trade. Increasing specialization by these and the major industrial nations has created an environment of interdependence in which each nation is but a piece of the larger world economic puzzle.

Trends in growth rates in selected industrialized countries are presented in tables on Gross National Product, Real Gross National Product, and Industrial Production. Factors underlying these growth trends are found in the tables on international investment patterns and various tables of comparative prices, wages, productivity, and unit labor costs. The data and charts on cost recovery allowable for tax purposes on machinery and equipment in selected industrial countries are especially interesting. These graphically demonstrate how our industrial competitors are able to invest more than the average American firm, and by inference, they also demonstrate why the U.S. rate of productivity growth in recent years has been considerably lower than that of our major competitors.

Growth in the world economy and world trade has brought about a growing interest in the balance of payments positions of the various countries. A nation's balance of payments is considered a key indicator of the health or weakness of an individual economy. The same can be said for an industry trading in the world marketplace. In recent years disparate inflation rates, exchange rate movements, the phasing of national business cycles, and energy related problems have caused dislocations in many nations' and industries' balance of payments positions.

Since 1975, the overall United States balance of trade has moved from a small surplus to record deficits. Until 1978, the U.S. machine tool industry remained in surplus in its world trade position though the relative size of the surplus had been declining throughout the 1970's. Record high machine tool imports by U.S. manufacturers, combined with relatively small increases in machine tool exports, led to substantial balance of trade deficits in machine tool trade from 1978 through the present. In a little over a decade, the share of the domestic market represented by imports has grown from a negligible amount to almost forty percent of total U.S. machine tool consumption.

The tables in this chapter provide comparative international statistics on world trade, balance of trade, balance of payments and export prices.

GROSS DOMESTIC PRODUCT (r)

(Billions of U.S. Dollars)

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
WORLD	$6,153	$6,704	$7,554	$8,906	$10,241	$11,565	$12,636	$12,550	$12,653	$12,562E
Of which:										
United States	1,532	1,698	1,895	2,134	2,375	2,586	2,908	3,021	3,257	3,619
Canada	165	198	202	209	232	261	293	301	327	337
Japan	499	559	687	963	998	1,040	1,145	1,063	1,158	1,234E
Australia	87	96	96	110	122	141	162	160	156	225
Belgium	63	68	79	97	111	119	98	86	82	78
France	339	351	384	474	574	655	573	543	517	492
West Germany	417	445	515	640	760	815	683	659	653	613
Italy	192	188	215	262	325	396	353	349	353	348
Netherlands	83	91	112	137	158	169	141	138	132	123
Spain	105	108	121	146	196	212	188	181	159	161
Sweden	72	78	83	91	108	124	113	99	91	95
Switzerland	54	57	61	85	95	102	94	97	97	91
United Kingdom	235	228	254	322	416	535	511	484	457	425
Saudia Arabia	40	47	58	66	71	116	154	153	120	108
Brazil	124	152	176	208	234	250	275	283	210	212
Mexico	88	89	82	103	135	186	240	167	145	175
U.S.S.R.	903	975	1,066	1,152	1,253	1,393	1,587	1,715	1,843	1,860E
China	135	125	142	179	215	246	231	225	247	272E
PER CAPITA WORLD	$1,498	$1,606	$1,777	$2,056	$2,327	$2,583	$2,772	$2,704	$2,680	$2,627E
United States	7,093	7,785	8,603	9,588	10,554	11,359	12,650	13,019	13,887	15,297
Canada	7,268	8,596	8,682	8,896	9,788	10,910	12,044	12,217	13,124	13,356
Japan	4,471	4,959	6,034	8,381	8,610	8,909	9,734	8,973	9,706	10,280
Australia	6,296	6,855	6,770	7,667	8,380	9,597	10,827	10,541	10,135	14,444
Belgium	6,417	6,926	8,049	9,840	11,275	12,119	9,945	8,763	8,311	7,921
France	6,418	6,638	7,226	8,905	10,734	12,201	10,610	10,016	9,455	8,945
West Germany	6,748	7,229	8,389	10,435	12,365	13,239	11,079	10,699	10,640	9,987
Italy	3,440	3,351	3,815	4,618	5,714	6,930	6,176	6,193	6,208	6,121
Netherlands	6,067	6,597	8,088	9,848	11,227	11,979	9,924	9,624	9,192	8,501
Spain	2,945	3,006	3,324	3,983	5,261	5,658	4,984	4,771	4,154	4,190
Sweden	8,845	9,501	10,007	11,024	13,008	14,940	13,564	11,898	10,888	11,378
Switzerland	8,471	8,943	9,583	13,380	14,992	15,908	14,628	14,897	14,988	13,954
United Kingdom	4,205	4,077	4,555	5,768	7,443	9,562	9,150	8,685	8,100	7,542
Saudia Arabia	5,474	6,149	7,345	8,027	8,276	12,943	16,513	15,815	11,513	10,031
Brazil	1,184	1,416	1,595	1,844	2,024	2,059	2,219	2,232	1,618	1,602
Mexico	1,463	1,426	1,268	1,569	1,995	2,687	3,366	2,287	1,932	2,274
U.S.S.R.	3,544	3,797	4,116	4,409	4,757	5,247	5,928	6,352	6,764	6,759
China	145	132	149	184	219	247	229	221	241	263

E - Estimate. r - Revised.

(a) Prior to 1981, the world total does not include Bulgaria, Czechoslovakia, East Germany, Poland, Romania, and North Korea. These countries are included after 1980 but the data represents GNP rather than GDP.

(b) Data for the U.S.S.R. series are GNP figures.

Note: GDP measures the total value of final output of a country's economy—that is, of the goods produced and services rendered within its territory by residents and nonresidents for a given period—without regard to its allocation among domestic and foreign claims.

Source: International Monetary Fund, "International Financial Statistics" (Supplement Series No. 8), Department of Commerce, Industry and Trade Administration, and Central Intelligence Agency, "Handbook of Economic Statistics."

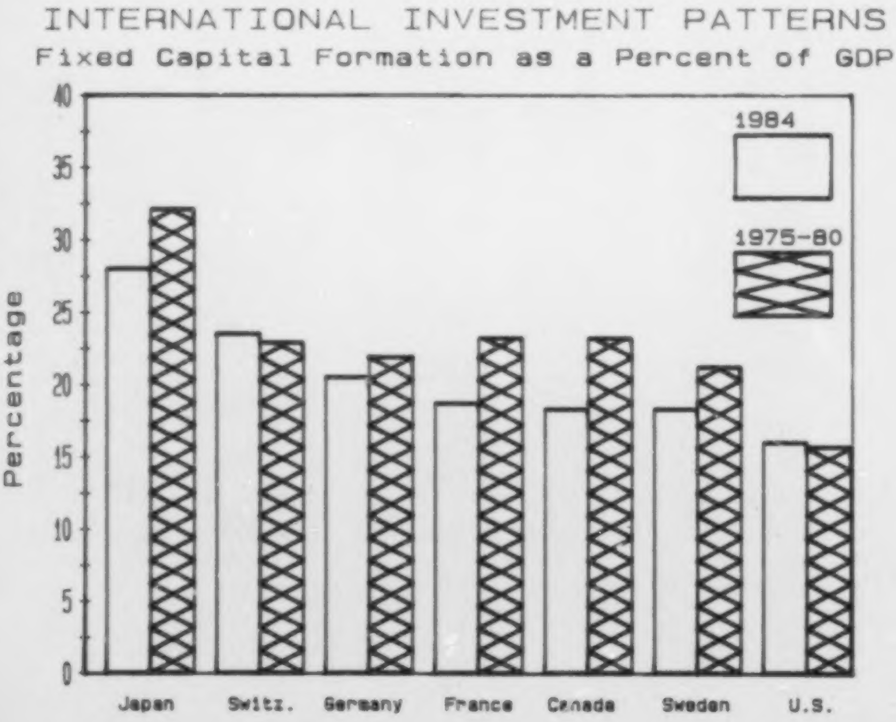
INTERNATIONAL INVESTMENT PATTERNS

	Gross Fixed Capital Formation as Percent of GDP									
	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
United States (a)	13.9%	14.5%	15.9%	16.9%	17.2%	15.9%	15.8%	14.6%	14.9%	16.0%
Canada	23.7	24.1	22.9	22.2	23.9	22.6	23.9	18.9	19.0	18.3
Japan	32.8	31.9	31.1	31.3	33.0	32.6	31.6	30.4	28.5	28.0
Australia	22.7	24.0	23.6	23.5	23.0	23.3	25.3	24.3	20.4	16.8
France	23.0	24.5	23.4	22.0	22.8	23.6	21.2	21.6	19.8	18.7
West Germany	19.8	21.3	21.1	21.4	23.8	24.1	21.8	20.3	21.1	20.5
Italy	20.3	23.7	21.4	20.0	21.3	25.0	21.3	20.1	18.0	17.9
Netherlands	20.6	20.6	21.6	21.9	21.5	21.5	18.3	17.8	18.0	18.1
Spain	26.5	24.9	22.6	20.3	20.1	21.2	20.6	19.7	19.2	17.9
Sweden	24.2	23.5	20.5	17.6	20.0	21.3	18.3	17.8	16.8	18.3
Switzerland	23.0	20.7	20.7	21.7	23.9	27.2	25.4	24.0	24.1	23.5
United Kingdom	18.6	20.1	19.8	19.6	19.9	16.8	15.2	16.1	16.5	16.3

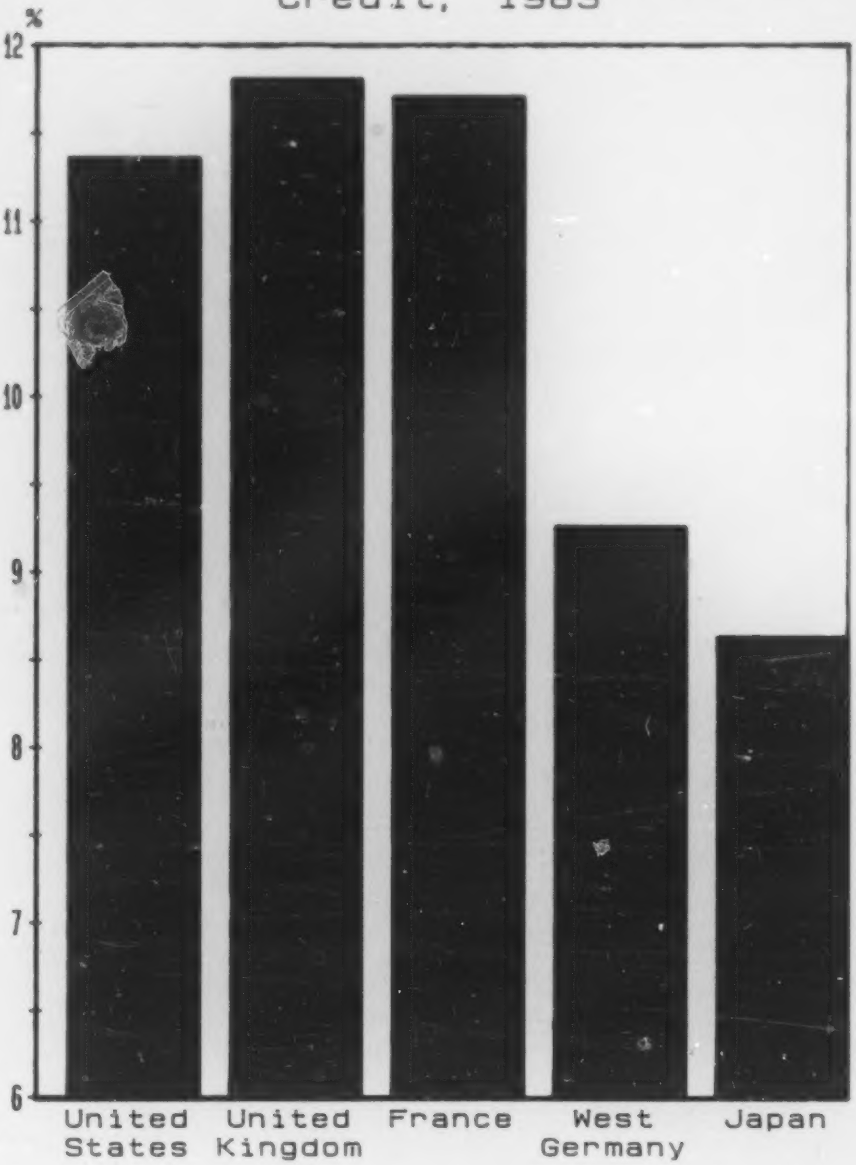
(a) This data consists of Private Gross Fixed Capital Formation, i.e. it excludes government capital formation which is included in the other nations' data.

Note: Fixed Capital Formation consists of non-residential structures and producers durable equipment as well as residential structures.

Source: International Monetary Fund, "International Financial Statistics" (Supplement Series No. 8); U.S. Department of Commerce.



Long Term Interest Rates on Government Supported Export Credit, 1983



U.S. DIRECT INVESTMENT (a) ABROAD BY MAJOR INDUSTRY AND COUNTRY—YEAR END 1983

(Billions of U.S. Dollars)

	Total	Manufacturing	Mining and Smelting	Petroleum	Other
Developed Countries	$169.6	$71.7	$4.0	$38.9	$55.0
Canada	47.5	19.8	2.1	10.9	14.7
Europe	102.5	44.0	Z	23.6	34.8
European Community	78.9	40.1	Z	19.3	19.4
United Kingdom	30.9	13.1	D	9.3	D
France	6.9	4.2	Z	0.9	1.7
West Germany	16.0	9.9	Z	3.3	2.8
Other EEC	25.1	12.9	D	5.8	D
Other Europe	23.6	3.8	Z	4.3	15.4
Japan	8.1	4.1	0.0	2.0	2.0
Australia, New Zealand, South Africa	11.5	3.9	1.8	2.4	3.5
Developing Countries	51.0	18.4	2.8	16.6	13.2
Latin America	29.5	14.7	2.2	6.8	5.7
Middle East (b)	3.0	0.2	D	0.9	D
Other Africa (c)	5.2	0.5	0.4	3.5	0.8
Other Asia and Pacific	13.3	2.9	D	5.3	D
Other Countries	5.6	—	—	4.3	1.2
Total	$226.1	$90.1	$6.7	$59.8	$69.5

D - Withheld to avoid disclosure. Z - Less than $50 million.

(a) Book value.

(b) Includes Bahrain, Iran, Israel, Jordan, Kuwait, Lebanon, Qatar, Saudi Arabia, South Yemen, Syria, United Arab Emirates, Oman and Yemen.

(c) Includes United Arab Republic (Egypt).

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Survey of Current Business," August 1984.

INDUSTRIAL PRODUCTION (a,r)

(1980 = 100)

Year	United States	Canada	Japan	EEC(b)	United Kingdom	France	West Germany	Italy
1964	55.6	51.5	30.9	58.4	80.8	60.0	62.0	47.5
1965	61.1	55.9	32.0	60.8	83.3	58.0	65.0	49.8
1966	66.5	59.4	36.2	63.2	84.6	61.0	65.0	55.5
1967	68.0	61.5	43.3	64.2	85.5	62.0	63.0	60.0
1968	72.3	65.9	50.7	68.9	91.0	65.0	69.0	63.9
1969	75.6	70.1	58.8	75.5	93.4	71.0	79.0	66.4
1970	73.3	71.3	66.9	79.1	93.5	75.0	83.0	72.1
1971	74.6	73.8	68.6	80.9	93.6	80.0	85.0	72.0
1972	81.4	79.4	73.6	84.5	95.7	84.0	88.0	75.2
1973	88.3	87.8	84.6	90.8	102.7	90.0	92.0	82.5
1974	88.0	90.6	81.2	91.3	98.7	92.0	90.0	86.2
1975	80.1	85.2	72.3	85.2	93.9	86.0	84.0	78.3
1976	88.7	90.2	80.4	91.5	95.9	93.0	91.0	87.9
1977	93.9	92.5	83.7	93.6	100.1	95.0	93.0	88.9
1978	99.4	95.0	89.3	96.1	103.3	97.0	95.0	88.8
1979	103.7	100.7	95.5	100.6	107.2	102.0	100.0	94.7
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	102.6	101.0	101.0	97.6	96.6	98.0	98.0	98.5
1982	94.3	90.2	101.3	96.1	98.6	96.0	95.0	95.4
1983	100.4	95.7	104.9	97.0	101.9	97.0	95.0	92.3
1984	111.1	104.0	116.5	99.3E	102.8	100.0	98.0	95.2

E - Estimate. r - Revised.

(a) Excludes construction.

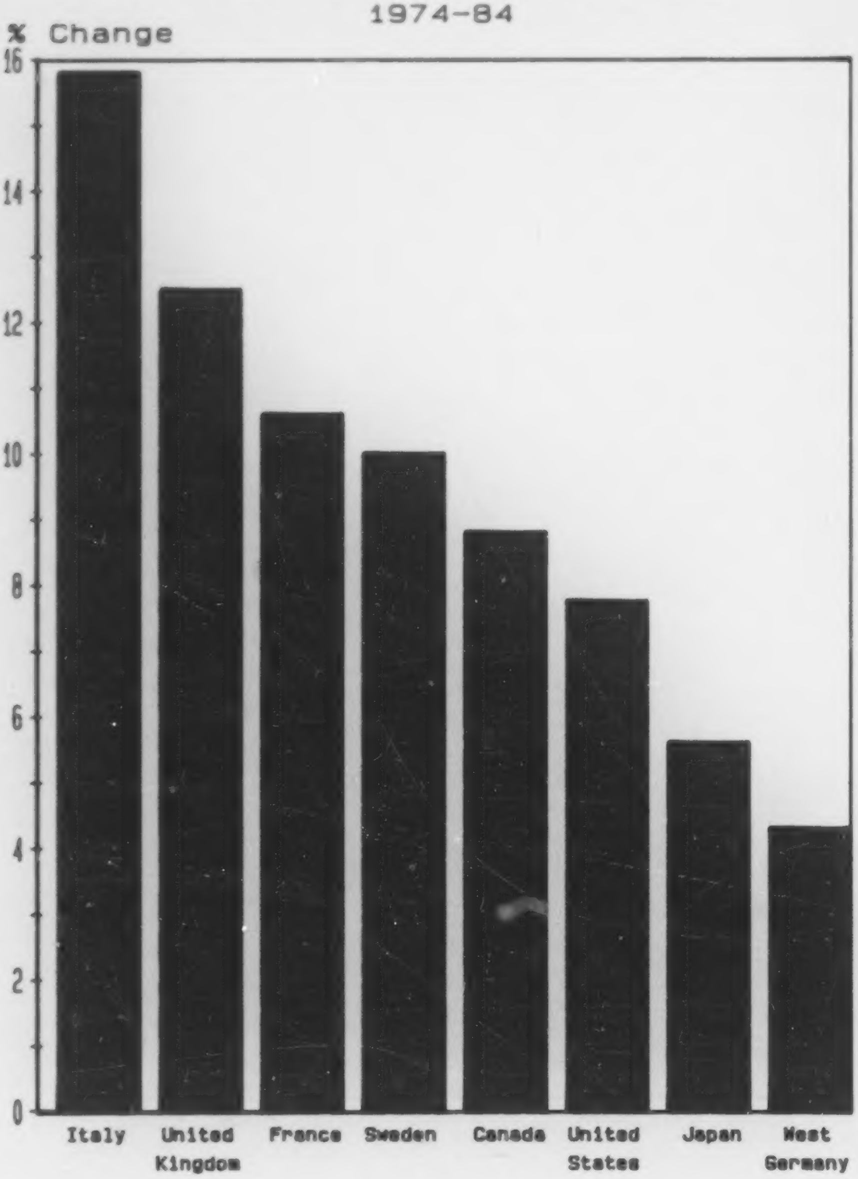
(b) Data for the European Economic Community (EEC) on this table contains statistics for Belgium, Denmark, France, Ireland, Italy, Luxembourg, Netherlands, United Kingdom, and West Germany, and also includes Greece after 1980.

Source: International Monetary Fund, "International Financial Statistics," and "The Economic Report of the President, 1985."

Consumer Prices

Average Annual Percent Change

1974–84



CONSUMER PRICES
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom	France	West Germany	Italy	Sweden
1964	37.6	37.3	30.4	21.2	31.3	52.1	22.7	31.7
1965	38.2	38.2	32.4	22.1	32.2	54.0	23.6	33.3
1966	39.4	39.6	34.0	23.0	33.0	55.9	24.2	35.4
1967	40.5	41.1	35.4	23.6	33.9	56.8	25.1	37.0
1968	42.2	42.7	37.3	24.7	35.5	57.8	25.5	37.7
1969	44.5	44.7	39.3	26.1	37.6	58.9	26.1	38.7
1970	47.1	46.1	42.3	27.7	39.9	60.9	27.4	41.4
1971	49.1	47.5	44.9	30.3	42.1	64.0	28.8	44.5
1972	50.8	49.7	46.9	32.5	44.7	67.6	30.4	47.2
1973	53.9	53.5	52.4	35.5	47.9	72.3	33.7	50.3
1974	59.8	59.3	65.2	41.1	54.5	77.4	40.1	55.3
1975	65.3	65.7	72.9	51.1	60.9	82.0	46.9	60.7
1976	69.1	70.7	79.7	59.6	66.8	85.5	54.8	67.0
1977	73.6	76.3	86.1	69.0	73.0	88.7	64.1	74.6
1978	79.2	83.2	89.4	74.7	79.4	91.1	71.9	82.0
1979(r)	88.1	90.7	92.6	84.8	87.9	94.9	82.5	87.9
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	110.4	112.4	104.9	111.9	113.4	106.3	117.8	112.1
1982	117.1	124.6	107.7	121.5	126.8	111.9	137.2	121.7
1983(r)	120.9	131.8	109.6	127.1	139.0	115.6	157.3	132.6
1984	126.1	137.5	112.1	133.4	149.3	118.4	174.3	143.2

r - Revised.

Source: International Monetary Fund, "International Financial Statistics."

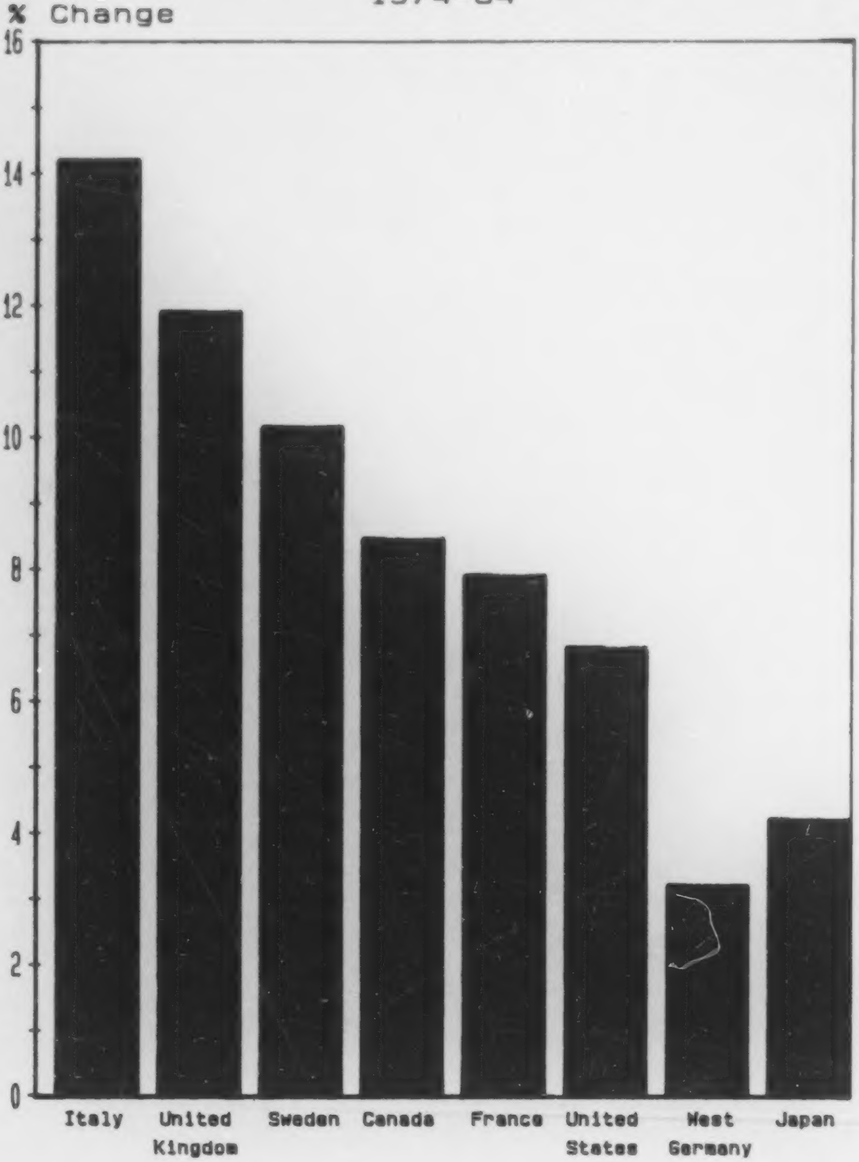
WHOLESALE PRICES
(1980 = 100)

Year	United States	Canada(a)	Japan	United Kingdom(b)	France(c)	West Germany(d)	Italy	Sweden(e)
1964	35.3	34.4	43.1	21.3	38.3	55.5	20.7	NA
1965	36.0	34.9	43.5	22.1	38.5	56.8	21.1	NA
1966	37.2	35.9	44.5	22.7	39.6	57.8	21.4	NA
1967	37.2	36.6	45.3	24.4	39.3	57.3	21.4	NA
1968	38.2	37.3	45.7	25.2	38.6	56.9	21.5	35.0
1969	39.7	38.7	46.7	26.2	42.8	57.9	22.3	36.0
1970	41.1	39.7	48.4	28.2	46.0	60.8	24.0	38.0
1971	42.4	40.4	48.0	30.6	46.9	63.4	24.8	39.0
1972	44.3	42.2	48.4	32.2	49.1	65.1	25.8	41.0
1973	50.1	47.0	56.0	34.6	56.3	69.4	30.2	46.0
1974	59.6	55.9	73.7	42.7	72.7	78.7	42.5	57.0
1975	65.1	62.2	75.9	52.1	68.6	82.3	46.1	61.0
1976	68.1	65.4	79.7	61.1	73.6	85.4	57.1	66.0
1977	72.3	70.5	81.2	72.0	77.7	87.7	66.5	73.0
1978	77.9	77.0	79.1	79.1	81.1	88.7	72.1	78.0
1979(r)	87.6	88.1	84.9	87.7	91.9	93.0	83.3	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981	109.1	110.2	101.4	109.6	111.0	107.8	116.6	111.0
1982(r)	111.3	116.8	103.2	118.0	123.3	114.1	132.8	125.0
1983(r)	112.7	120.9	100.9	124.4	136.9	115.8	145.7	139.0
1984	115.4	125.8	100.7	132.1	155.1	119.2	160.8	150.0

NA - Not Available. r - Revised.

(a) Industrial selling prices.
(b) Manufacturing output prices.
(c) Industrial goods prices.
(d) Industrial products prices.
(e) Domestic supply prices.

Source: International Monetary Fund, "International Financial Statistics;" Department of Commerce, "International Economic Indicators."



Wholesale Prices
Average Annual Percent Change
1974-84

UNIT VALUE OF EXPORTS
(1980 = 100)

Year	United States	Canada	Japan	United Kingdom(a)	France	West Germany(a)	Italy	Sweden
1968	35.2	32.3	54.4	23.8	35.2	61.5	20.5	33.0
1969	36.2	33.0	56.9	24.6	37.8	63.4	21.4	34.0
1970	38.2	34.1	59.5	26.4	41.7	61.2	22.4	37.0
1971	39.4	34.4	60.7	27.9	44.1	63.5	23.6	39.0
1972	40.7	35.5	59.9	29.5	44.6	65.4	24.3	41.0
1973	47.4	40.5	63.6	33.2	49.0	68.4	28.8	45.0
1974	60.5	53.7	85.4	42.4	61.8	79.4	40.8	57.0
1975	67.6	59.5	87.4	51.9	65.2	86.2	45.3	66.0
1976	69.9	60.9	86.9	62.1	71.2	89.7	55.3	70.0
1977	72.4	64.8	87.1	72.1	78.2	85.9	65.9	74.0
1978(r)	77.4	71.0	82.2	79.0	82.2	86.7	70.7	78.0
1979(r)	88.1	86.0	89.8	87.5	90.2	91.3	82.8	88.0
1980	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1981(r)	109.2	106.3	103.0	108.8	113.0	106.3	122.3	109.0
1982(r)	110.4	107.2	108.4	116.6	129.0	110.9	141.7	123.0
1983(r)	111.6	105.8	101.1	126.6	142.5	112.4	149.8	137.0
1984	113.1	107.3	100.7	136.9	158.7	116.3	NA	147.0

r - Revised. NA - Not Available.

(a) Data for the United Kingdom and West Germany were recently revised, but the revised figures are still unavailable for years prior to 1977. There is therefore a discontinuity between the data prior to 1977 and the data for 1977 on.

Source: International Monetary Fund, "International Financial Statistics."

SOVIET UNION FOREIGN TRADE (a)
(Millions of U.S. Dollars)

	Exports			Imports		
Year	Total	Communist Countries (b)	Non-communist Countries	Total	Communist Countries (b)	Non-communist Countries
1965	$ 8,175	$ 5,556	$ 2,618	$ 8,058	$ 5,610	$ 2,448
1966	8,841	5,873	2,968	7,913	5,264	2,649
1967	9,652	6,377	3,275	8,537	5,946	2,591
1968	10,634	7,134	3,500	9,410	6,367	3,043
1969	11,655	7,682	3,973	10,327	6,696	3,631
1970	12,800	8,367	4,433	11,732	7,636	4,095
1971	15,918	10,398	4,788	14,388	9,432	4,302
1972	16,312	10,608	6,768	17,049	10,913	6,216
1973	21,175	12,215	8,978	20,825	12,351	8,442
1974	27,374	14,641	12,733	24,861	13,601	11,260
1975	33,407	20,271	13,136	37,072	19,415	17,657
1976	37,550	22,040	15,510	38,542	20,246	18,296
1977	45,094	25,901	19,193	40,806	23,284	17,521
1978	52,432	31,244	21,188	50,798	30,494	20,305
1979	64,913	36,152	28,761	57,961	32,801	25,160
1980	76,470	41,463	35,007	68,477	36,424	32,052
1981	78,809	43,044	35,764	72,631	36,905	35,727
1982	86,940	46,985	39,955	77,644	42,415	35,229
1983	91,653	50,914	40,739	80,440	45,484	34,957
1984	91,492	51,790	39,702	80,352	47,010	33,342

(a) Exports and imports are F.O.B.

(b) Up to 1980, the following are included in the Communist Countries category: Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Hungary, Poland, Romania, China, and Mongolian People's Republic. After 1980 the following are included in the category: Bulgaria, China, Cuba, Czechoslovakia, German Democratic Republic, Hungary, Korea, Laos, Mongolian People's Republic, Vietnam, and Yugoslavia.

Source: U.S. Department of Commerce, "Overseas Business Reports."

WORLD TRADE (a)

(Billions of U.S. Dollars)

	1981(r)		1982(r)		1983(r)		1984(p)	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
United States(b)	$ 234	$ 273	$ 212	$ 255	$ 201	$ 270	$ 218	$ 327
Canada	73	70	71	58	77	65	90	78
Japan	152	143	138	132	147	126	169	138
European Community	612	645	590	616	575	591	616	626
United Kingdom	102	103	97	100	92	100	93	106
France	106	121	97	116	95	105	100	106
West Germany	176	164	176	155	169	153	170	156
Italy	75	91	74	86	73	80	73	82
Other developed	189	230	182	219	180	202	197	236
Less developed	541	489	463	463	431	422	471	433
OPEC	278	157	215	166	176	140	185	133
Other	263	332	247	297	255	282	285	300
Communist	205	200	224	203	236	213	245	220
Total(c)	$2,006	$2,050	$1,880	$1,945	$1,847	$1,889	$2,004	$2,058

p - Preliminary. r - Revised.

(a) Import values are cost, insurance, and freight (c.i.f.) except for Communist countries', which are free on board (f.o.b.).
(b) Exports include Department of Defense shipments.
(c) Individual items may not add to totals due to rounding.

Source: "Economic Report of the President," February 1985.

These figures show exports and imports of merchandise only.

U.S. TRADE WITH COMMUNIST COUNTRIES (a,c)

(Millions of U.S. Dollars)

	U.S. Exports			U.S. Imports		
Year	To Eastern Europe (b)	To USSR	To People's Republic of China	From Eastern Europe (b)	From USSR	From People's Republic of China
1963	$ 143.9	$ 22.9	Z	$ 60.3	$ 21.2	$ 0.3
1964	193.6	146.4	Z	77.8	20.7	0.5
1965	94.8	45.2	Z	94.8	42.6	0.5
1966	156.0	41.7	Z	129.1	49.6	
1967	135.0	60.3	Z	136.1	41.2	0.2
1968	157.3	57.7	Z	140.0	58.5	Z
1969	143.7	105.5	Z	144.0	51.5	Z
1970	234.9	118.7	Z	153.5	72.3	Z
1971	222.2	162.0	Z	165.8	57.2	4.9
1972	276.9	542.2	$ 63.5	225.0	95.5	32.4
1973	606.5	1,194.7	689.6	306.1	220.1	64.9
1974	823.4	609.2	807.4	539.4	350.4	114.7
1975	951.0	1,836.9	303.8	472.9	255.3	157.4
1976	1,189.7	2,305.9	135.4	646.2	220.6	201.9
1977	911.9	1,623.5	171.3	683.7	234.3	202.7
1978	1,420.2	2,249.0	818.2	969.8	540.4	324.0
1979	2,066.2	3,603.6	1,716.5	998.8	873.2	592.3
1980	2,339.8	1,509.7	3,749.0	982.0	452.9	1,058.3
1981	1,904.2	2,338.6	3,598.6	1,206.7	347.4	1,895.3
1982	1,012.8	2,583.7	2,912.1	839.4	227.6	2,283.7
1983	887.8	2,002.9	2,173.1	1,011.5	347.1	2,244.1
1984	903.9	3,283.9	3,004.3	1,599.4	554.2	3,064.8

Z - Less than $50,000.

(a) Exports and imports are f.a.s. transaction values, except prior to 1974, where imports are customs values.
(b) Does not include Yugoslavia.
(c) Data for 1978 to the present are not directly comparable to prior years due to commodity schedule changes.

Source: U.S. Department of Commerce; "Overseas Business Reports."

BALANCE OF TRADE AND PAYMENTS

(Billions of U.S. Dollars)

	Balance of Trade (a)	Balance on Current Account (b)
United States (c)		
1982(r)	$ -42.6	$ -9.2
1983(r)	-69.3	-41.6
1984E	-109.1	-102.4
Canada		
1982(r)	12.1	2.2
1983(r)	11.7	1.4
1984E	12.1	1.0
Japan		
1982(r)	6.9	6.9
1983(r)	20.5	20.8
1984E	30.3	32.3
United Kingdom		
1982(r)	-2.7	9.1
1983(r)	-8.5	4.4
1984E	-13.4	-1.5
France		
1982(r)	-19.0	-12.1
1983(r)	-10.5	-4.4
1984E	-5.8	-.3
West Germany		
1982(r)	21.1	3.8
1983(r)	16.5	4.1
1984E	14.6	2.3
Italy		
1982(r)	-12.7	-5.5
1983(r)	-7.7	.8
1984E	-9.0	-1.0

r - Revised. E - Estimate.

(a) Balance of payments basis (exports f.o.b. less imports c.i.f.).
(b) Net exports of goods and services and unilateral transfers (OECD basis).
(c) Refer to Chapter 1 for historical chart of the United States balance of trade.

Source: "Economic Report of the President," February 1985.

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS IN MANUFACTURING

For Selected Years

(U.S. Dollars)

	1970	1975(r)	1980(r)	1982(r)	1983(r)	1984E	Percent Increase 1975-1984
United States	$ 4.20	$6.35	$ 9.89	$11.63	$12.26	$12.82	102%
Canada	3.46	6.10	8.91	10.68	11.44	11.51	89
United Kingdom	1.46	3.26	7.37	6.76	6.28	5.95	83
France	1.74	4.59	9.13	7.95	7.77	7.23	58
West Germany	2.32	6.19	12.33	10.42	10.37	9.57	55
Italy	1.75	4.65	8.00	7.36	7.62	7.43	60
Sweden	2.96	7.18	12.51	10.07	8.89	9.20	28
Japan	.99	3.05	5.61	5.70	6.14	6.42	110

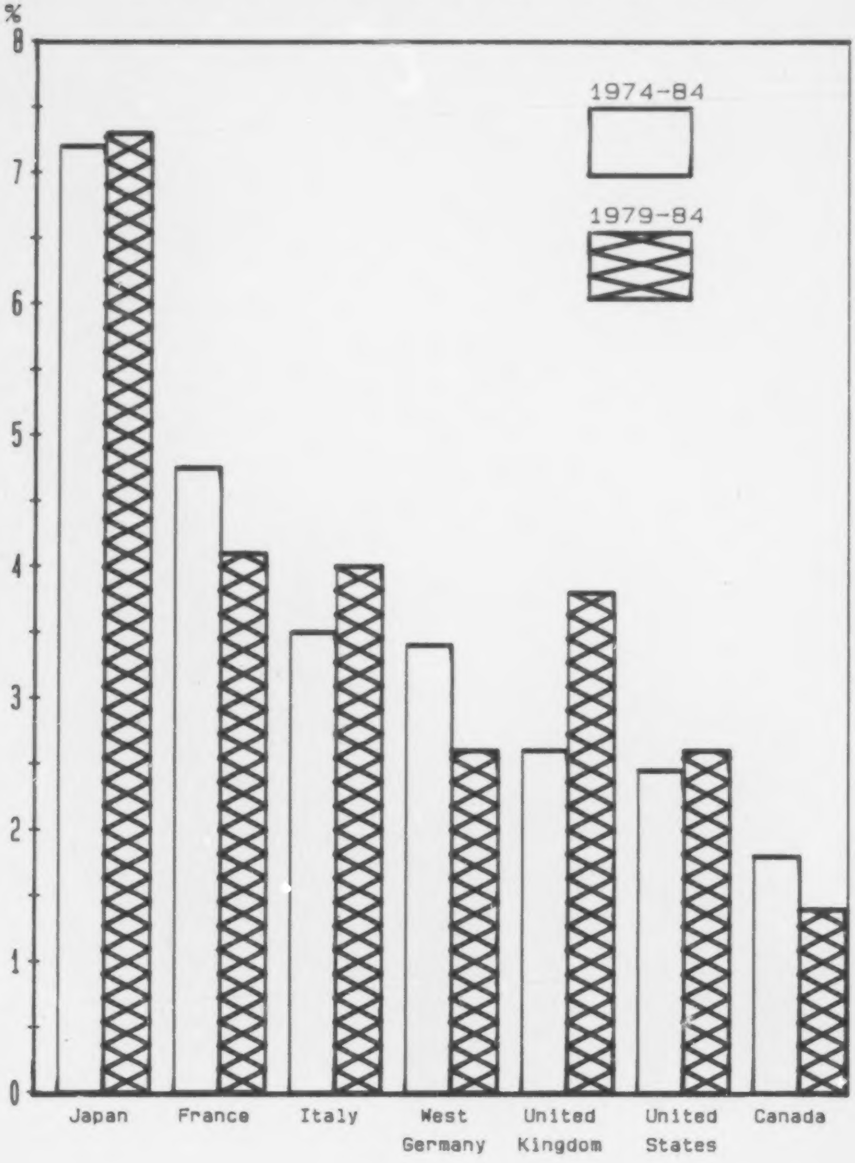
r - Revised. E - Estimate.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

For international comparisons of compensation in the machine tool industry, see Chapter 7.

Productivity

Average Annual Increase in Output per Man-Hour in Manufacturing



PRODUCTIVITY IN MANUFACTURING (r)
Selected Countries, 1966 to Date
Indexes: 1977 = 100

	United States	Canada	Japan	France	West Germany	Italy	United Kingdom
Unit Labor Cost (a)							
1966	59.4	53.0	37.4	47.4	34.2	40.4	53.7
1967	62.4	55.2	36.5	48.0	33.9	42.5	52.0
1968	64.6	55.5	37.9	48.9	33.7	42.0	45.3
1969	67.9	56.4	39.1	47.0	35.1	44.3	48.2
1970	72.7	61.7	41.3	46.8	43.2	50.6	54.6
1971	72.7	64.1	46.4	50.3	48.9	57.5	61.4
1972	73.0	67.0	55.2	57.1	55.4	64.5	66.0
1973	74.2	68.8	68.6	70.4	71.0	73.1	67.9
1974	84.1	79.7	81.7	74.5	79.5	77.6	80.4
1975	91.5	89.8	90.4	99.5	89.2	104.3	101.1
1976	94.6	100.7	88.2	96.3	87.6	90.5	92.6
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	107.3	98.1	126.2	117.3	121.6	115.6	126.4
1979	117.0	103.0	117.9	135.5	136.2	129.5	163.4
1980	130.5	116.4	111.8	153.4	147.5	141.4	217.2
1981	138.4	129.1	116.4	133.4	124.9	126.3	202.9
1982	147.6	142.3	101.2	122.6	120.7	125.4	182.2
1983	146.4	143.1	104.4	113.9	114.1	127.4	158.8
1984	146.5	133.0	98.4	103.0	101.4	114.5	145.4
Hourly Compensation (a)							
1966	44.8	34.4	13.6	25.1	19.1	22.8	35.5
1967	47.0	36.9	15.3	26.9	20.2	25.4	36.0
1968	50.4	39.7	17.9	30.3	21.7	27.1	33.6
1969	53.9	42.7	21.3	30.8	24.2	30.7	36.6
1970	57.6	47.4	25.4	32.4	30.6	36.8	42.4
1971	61.1	52.7	30.3	36.8	35.9	43.1	50.0
1972	64.4	57.6	40.1	44.2	43.5	52.3	57.6
1973	69.0	62.8	55.0	57.7	59.3	66.4	63.2
1974	76.4	74.4	67.1	63.3	69.3	74.0	76.7
1975	85.5	81.7	77.1	87.9	80.2	95.0	95.6
1976	92.3	96.9	82.3	91.4	84.3	89.5	92.0
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	108.3	99.5	136.1	124.2	124.7	119.1	128.4
1979	118.8	107.3	138.5	149.9	146.2	143.1	166.8
1980	132.7	118.7	143.8	172.5	159.8	165.3	217.0
1981	145.2	134.3	158.0	154.8	137.8	152.8	215.3
1982	158.0	143.9	147.2	151.4	134.7	154.7	202.1
1983	163.4	153.9	159.5	146.7	133.4	161.0	187.9
1984	169.4	148.8	164.7	139.3	124.1	153.8	178.7
Output Per Man Hour (Productivity)							
1966	75.4	64.9	36.5	52.9	56.0	56.4	66.0
1967	75.3	66.9	41.9	56.1	59.5	59.7	69.2
1968	78.0	71.5	47.1	62.0	64.5	64.5	74.1
1969	79.3	75.7	54.5	65.6	68.9	69.4	75.9
1970	79.2	76.8	61.4	69.3	70.9	72.7	77.6
1971	84.0	82.3	65.3	73.1	73.5	74.9	81.4
1972	88.2	85.9	72.7	77.5	78.5	81.1	87.3
1973	93.0	91.3	80.2	82.0	83.4	90.9	93.1
1974	90.8	93.4	82.1	85.0	87.2	95.3	95.4
1975	93.4	91.0	85.3	88.4	89.8	91.1	94.5
1976	97.6	96.2	93.3	94.9	96.2	98.9	99.4
1977	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1978	100.9	101.4	107.9	105.9	102.5	103.0	101.6
1979	101.6	104.2	117.4	110.6	107.4	110.5	102.1
1980	101.7	101.9	128.6	112.4	108.4	116.9	99.9
1981	104.9	104.0	135.7	116.0	110.3	121.0	106.1
1982	107.1	101.1	145.4	123.5	111.6	123.4	110.9
1983	111.6	107.6	152.8	128.8	116.8	126.4	118.3
1984	115.6	111.9	167.4	135.2	122.3	134.4	123.0

r - Revised.

(a) U.S. dollar basis.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

COST RECOVERY ALLOWABLE FOR TAX PURPOSES ON MACHINERY AND EQUIPMENT, 1984

(Percent of Original Cost)

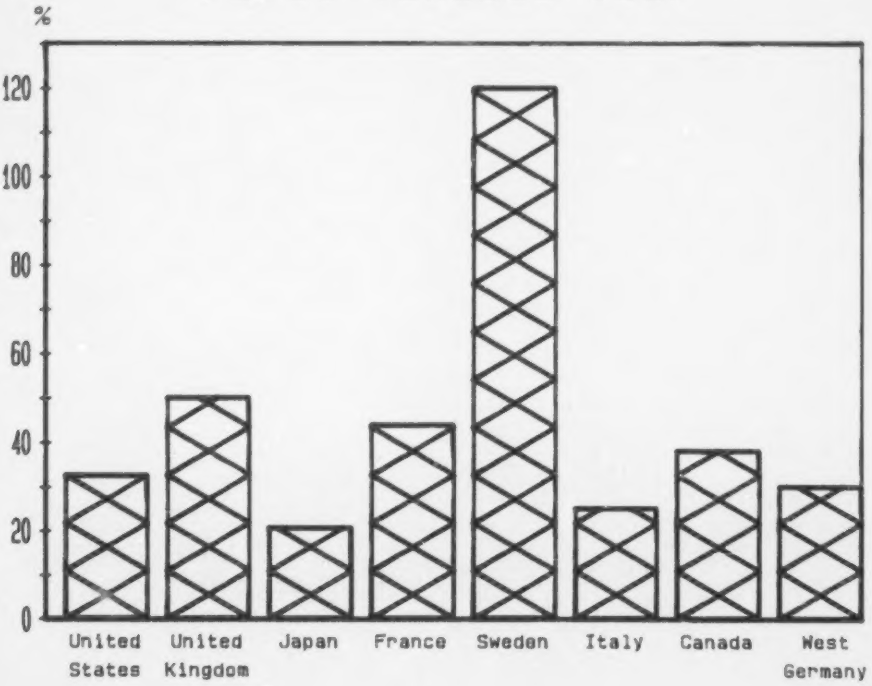
Country	Recovery Period (Years)	First Year	Third Year	Seventh Year
United States	5	32.4%	75.4%	117.4%
United Kingdom	11	50.0	71.9	91.1
Japan	10	20.6	50.0	80.1
France	8	43.8	73.4	95.8
Sweden	1	120.0	120.0	120.0
Italy	6	25.0	75.0	100.0
Belgium	7	33.0	61.8	102.0
Canada	3	38.0	108.2	108.2
Netherlands	8	45.0	70.0	120.0
West Germany	10	30.0	65.7	91.7
Australia	5	20.0	60.0	100.0

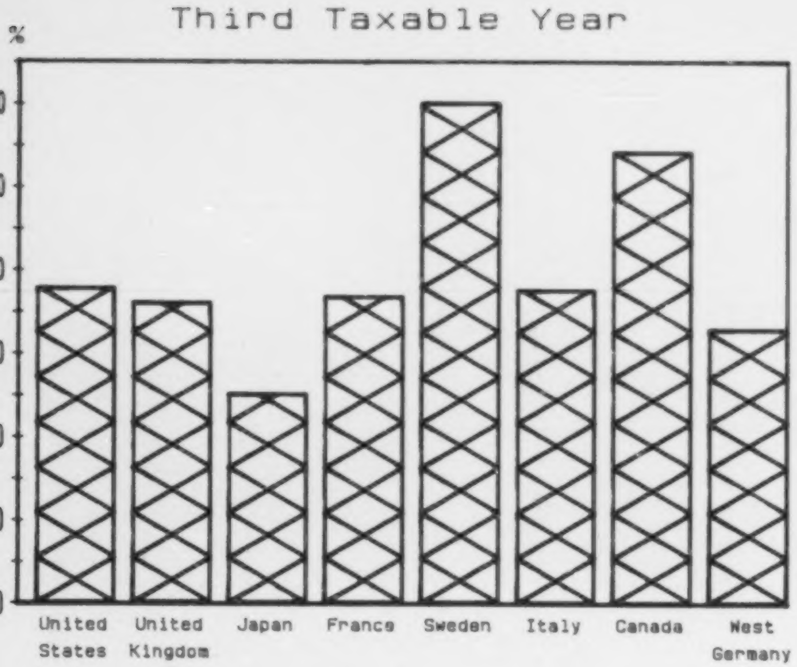
Note: These capital cost recovery allowances are based on current statutory or other published provisions of law. As such they do not reflect the informal or ad hoc arrangements that are frequently available in foreign countries to increase the rate of cost recovery actually allowed to industrial producers.

Source: Report of the President's Task Force on Business Taxation, September 1970, pages 28-29 updated by Price Waterhouse & Company. The most recent data is for the year 1984.

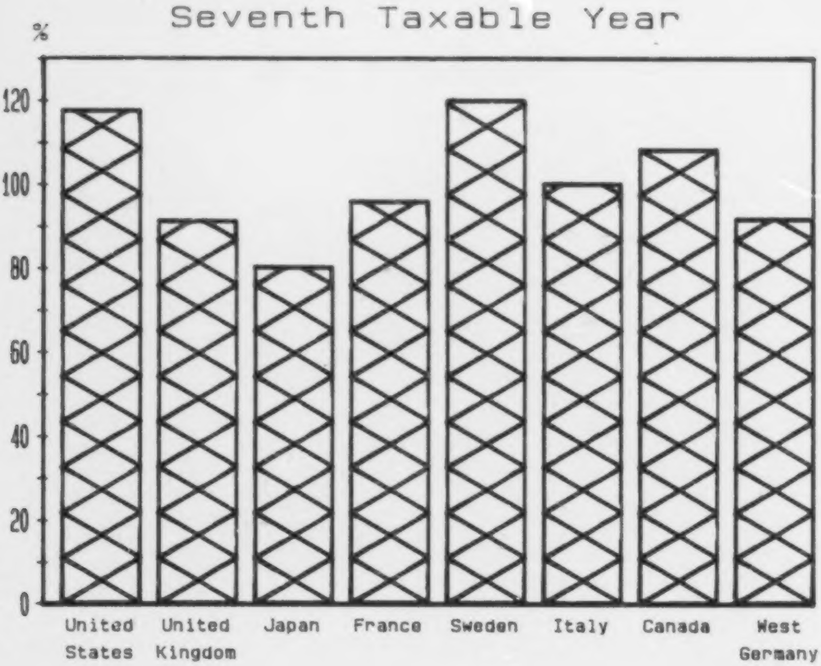
Cost recovery allowable for tax purposes includes depreciation as well as any tax credits. Where credits are available, total allowable cost recovery can exceed 100% of the original purchase cost. The rate of depreciation determines how quickly these costs are recovered. The percent values as stated are based on accelerated depreciation rates applicable in each country on a "typical" piece of capital equipment. At the end of the depreciation period, the taxable profits of the enterprise will have been reduced by the allowable cost recovery. The actual tax savings will depend on the tax rate prevailing in the specific country.

First Taxable Year





Third Taxable Year



Seventh Taxable Year

FEDERAL, STATE AND LOCAL TAX REVENUES AS PERCENT OF GNP, 1982
Selected Countries

Country	Total	Sales & Excise (a)	Social Security Total (b)	Corporate Income	Non-Corporate Income (b)	Other (d)
Belgium	46.7%	11.4%	13.9%	2.8%	16.9%	1.7%
Canada	34.9	9.4	3.9	2.8	12.2	6.6
Denmark	44.0	15.5	1.2	1.1	23.4	2.8
France	43.7	12.6	18.9	2.2	5.6	4.4
Italy	39.9	6.3	18.8	3.2	9.7	1.9
Japan	27.2	3.6	8.3	5.4	6.9	3.0
Luxembourg	37.7	8.2	10.6	5.8	10.5	2.6
Netherlands	45.5	9.8	18.9	3.1	10.9	2.8
Sweden	50.3	11.5	14.0	1.7	20.5	2.6
Switzerland	30.9	5.6	9.6	1.9	11.1	2.7
Turkey	20.1	5.9	1.0	2.6	8.8	1.6
United Kingdom	39.6	10.8	6.7	3.8	11.2	7.1
United States	30.5	4.6	8.4	2.1	11.5	3.9
West Germany	37.3	9.5	13.5	1.9	10.8	1.6

(a) Includes general sales, value added, and specific excise taxes.

(b) Includes contributions of employers, employees, and self-employed.

(c) Includes income taxes on individual and unincorporated enterprise.

(d) Includes taxes on net wealth and immovable property, taxes and stamp duties on gifts, inheritances, etc.

Source: "Revenue Statistics of OECD Member Countries," (Annual).

SOCIAL SECURITY TAX REVENUES AS PERCENT OF GNP, 1982
Selected Countries

Country	Total (a)	Employees	Employers	Self-Employed and Other
Belgium	13.9%	4.7%	8.0%	1.2%
Canada	3.9	1.4	2.5	0.1
Denmark	1.2	0.7	0.6	0.0
France	18.9	5.0	12.6	1.3
Italy	18.8	2.8	14.8	1.2
Japan	8.3	2.9	4.2	1.2
Luxembourg	10.6	4.2	5.8	0.6
Netherlands	18.9	8.2	8.0	2.8
Sweden	14.0	0.0	13.5	0.6
Switzerland	9.6	3.2	3.2	3.2
Turkey	1.0	0.4	0.6	0.0
United Kingdom	6.7	3.0	3.6	0.2
United States	8.4	3.3	4.9	0.3
West Germany	13.5	6.0	7.2	0.2

NA - Not Available.

(a) The category is broadly defined to include all tax payments to institutions of general government providing social welfare benefits, provided they are levied as a function of pay or as a fixed amount per person. Thus, for the United States, this category includes contributions to the railroad retirement fund, unemployment insurance fund, workmen's compensation fund, and civil service retirement program in addition, of course, to the more familiar social security payments made pursuant to the Federal Insurance Contributions Act (FICA).

Source: "Revenue Statistics of OECD Member Countries," (Annual).

3

U. S. MACHINE TOOL INDUSTRY

The "Machine Tool Industry" actually consists of two industries according to the government's Standard Industrial Classification system (SIC); Metal Cutting Machine Tools (SIC 3541) and Metal Forming Machine Tools (SIC 3542).

The distinction between "industries" and "products" should be clearly kept in mind to avoid confusion in studying the statistical data in this Handbook. In brief, the machine tool industry produces not only machine tools but other products. The reverse of this is also true—not all machine tools are produced by the machine tool industry—some other industries also produce machine tools.

The machine tool industry is made up of the establishments whose "primary products" are machine tools. Data on shipments by the machine tool industry covers the totality of the shipments of the establishments in the industry. This means that not only the machine tools but also "secondary products"—products that are generally produced by other industries—are covered. Such secondary products may be tooling, machine tool accessories, abrasive products, wood- or plastic-working machines, or a variety of other products.

To measure the degree to which an industry produces its primary and secondary products, the Census Bureau has developed a "primary specialization ratio" which describes the proportion of total product shipments that are "primary products." For the metal cutting industry this specialization ratio was 91% for 1982. This means that 91% of the products shipped by this industry were metal cutting machine tools and 9% were products other than metalcutting machine tools. For metal forming, the corresponding figures are 89% and 11%.

The Bureau of the Census reports not only "industry" totals but also "product" totals. To obtain a product total, it adds to the machine tools produced by the machine tool industry all the machine tools produced by other industries as secondary products.

In addition to the industry specialization ratio described above, the Census has developed a ratio to describe the proportion of primary products produced by the establishments classified in the industry to total shipments of such products by all manufacturing establishments. This ratio is called the "coverage ratio." In 1982, the coverage ratio in metal cutting was 93%, in metal forming 87%. This means that the metal cutting industry produced 93% of all metal cutting machine tools produced in the U.S., the metal forming industry 87% of all American metal forming machine tools.

The data in Chapter 3 deal exclusively with the machine tool INDUSTRY. Chapter 4 deals with PRODUCTS—total machine tool orders and shipments. As already indicated, industry data are based on the Standard Industrial Classification system. This system was developed to classify establishments by type of activity—it covers the entire field of economic activities. The system is structured by digits. The first two digits identify the major industry group, the third digit identifies the industry group, and the fourth digit identifies the industry. The fifth, sixth, and seventh digits are used to define product classes (fifth) and individual products (sixth and seventh). For example:

Industries	Major Group 35:	Machinery, Except Electrical
	Group 354:	Metalworking Machinery, and Equipment
	Industry 3541:	Machine Tools, Metal Cutting Types
Products	Product Class 35413:	Gear Cutting Machines
	Product 3541371:	Gear Tooth Finishing Machines

Size of the Industry

The machine tool industry is relatively small compared to other U.S. industries. Many of the larger industrial corporations have more employees and a higher value of product shipments than the entire machine tool industry. If all of the machine tool industry were combined into one firm, its sales would rank 161st on the 1984 "Fortune 500" listing of America's largest manufacturing companies.

While the most recent Census of Manufactures (1982) reports almost 1,400 establishments in SIC 3541 and SIC 3542, estimates by the NMTBA and Census Bureau indicate that approximately 40% of these plants primarily manufacture machine tool accessories, dies, tools, jigs and fixtures rather than machine tools. According to the 1982 Census, two-thirds of these establishments had fewer than 20 employees.

Location of the Industry

During the 19th century, the machine tool industry was located almost entirely in New England. Its center moved southward into the Middle Atlantic States and Pennsylvania and then west into Ohio and other parts of the Middle West as the 1800's drew to a close. Development and growth were closely related to the growth of other industries such as textile machinery, small arms, watches and clocks, ships, railroads, farm machinery, and bicycles. By 1900, Cincinnati had become the leading machine tool center, Philadelphia was second, Providence, R.I., third. In the 1920's the rapid growth of the automobile industry accounted for the rapid growth of machine tool production in Michigan and Illinois. The decline of Pennsylvania as a machine tool producer was closely related to the decline of the locomotive. Today, the leading metal cutting machine tool producing states are Ohio, Michigan, Illinois, Connecticut, New York and Wisconsin, and the leading metal forming machine tool producers are Illinois, Ohio, Michigan, New York, and Connecticut.

Sources of Industry Data

Data on the machine tool industry comes from the Census of Manufactures (which takes place every five years) and the Annual Survey of Manufactures. The Census is based on reports from individual establishments and is very detailed. However, the Census suffers from several shortcomings. It focuses primarily on large establishments, thus data on smaller establishments are less reliable. Much of the data published for smaller firms is actually not the product of either the Census or the Annual Surveys. Instead, most of the data for firms with fewer than twenty employees is estimated from administrative records on payroll and sales supplied to the Census Bureau by other government agencies. It is often the case that over ninety percent of the data on small firms is the product of these administrative record based estimates.

A second problem with the Census is that it is published with a considerable time lag. Because 1982 was a Census year and because of the time lag in the publication of the Census data, many of the charts and tables in this chapter were previously published using preliminary Census statistics. The final Census data were published in early 1985 and all charts and tables citing the Census have been revised to reflect these final statistics.

In general, the industry finds that its own data, and those released quarterly by the government as "Current Industrial Reports" (MQ-35W), are more useful and timely. The main value of the 5-year Census lies in the broader coverage and in the fact that shipment, employment, compensation, and other data are all available for the same population. This permits the calculation of ratios otherwise not available. The Annual Survey of Manufactures is based on sample surveys and covers fewer items than the Census. It is also published with a considerable delay between the time of data collection and distribution.

THE MACHINE TOOL INDUSTRY (a)
General Statistics, 1958 to Date

	Establishments			Value Added by Manufacture	Cost of Materials	Value of Shipments
Year	Total	With 20 or More Employees	Employees (Number)	(Millions of Dollars)		
TOTAL INDUSTRY, SIC 3541 and 3542						
1958	918	378	75,366	$ 597.0	$ 347.8	$ 997.5
1959	NA	NA	75,091	737.4	403.3	1,111.5
1960	NA	NA	81,200	815.8	468.7	1,265.7
1961	NA	NA	78,108	771.8	456.4	1,241.9
1962	NA	NA	82,251	936.8	513.7	1,430.3
1963	1,167	415	83,136	980.6	547.0	1,502.2
1964	NA	NA	88,079	1,154.7	678.7	1,790.7
1965	NA	NA	96,344	1,342.6	813.5	2,107.2
1966	NA	NA	108,174	1,666.3	981.3	2,553.8
1967	1,253	506	116,400	1,828.5	1,062.3	2,841.2
1968	NA	NA	112,200	1,830.4	988.9	2,817.3
1969	NA	NA	110,600	1,894.6	1,034.7	2,834.8
1970	NA	NA	100,200	1,581.7	992.6	2,597.8
1971	NA	NA	78,400	1,183.7	751.2	2,018.8
1972(r)	1,277	437	76,600	1,319.4	821.6	2,114.4
1973	NA	NA	86,900	1,760.6	1,134.9	2,777.3
1974	NA	NA	94,000	2,250.7	1,523.3	3,579.8
1975	NA	NA	88,800	2,258.6	1,533.5	3,834.4
1976	NA	NA	81,000	2,285.2	1,286.2	3,566.9
1977(r)	1,343	469	83,100	2,588.0	1,491.7	3,943.3
1978	NA	NA	89,500	3,108.3	1,994.1	4,977.8
1979	NA	NA	96,100	3,837.8	2,423.9	6,052.5
1980	NA	NA	99,700	4,391.3	2,744.6	6,980.7
1981(r)	NA	NA	98,300	4,716.4	2,850.0	7,481.0
1982(r)	1,392	455	77,600	3,332.3	2,164.1	5,868.9

NA - Not Available. r - Revised.

(a) The machine tool industry (Standard Industrial Classification SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures."

THE MACHINE TOOL INDUSTRY (a)
General Statistics 1958 to Date
Metal Cutting and Metal Forming

	Establishments			Value Added by Manufacture	Cost of Materials	Value of Shipments
Year	Total	With 20 or More Employees	Employees (Number)	(Million of Dollars)		
METAL CUTTING MACHINE TOOL INDUSTRY, SIC 3541						
1958	627	231	52,864	$ 421.0	$ 217.7	$ 679.8
1963	801	269	61,058	699.3	381.6	1,050.8
1965	NA	NA	70,827	993.6	559.2	1,524.4
1966	NA	NA	79,767	1,234.2	669.4	1,826.1
1967	903	338	87,200	1,391.3	766.9	2,127.2
1968	NA	NA	84,300	1,377.1	718.9	2,099.1
1969	NA	NA	82,600	1,441.5	744.5	2,108.3
1970	NA	NA	71,300	1,112.1	664.0	1,821.7
1971	NA	NA	54,000	819.8	473.2	1,351.1
1972	894	275	52,500	901.7	536.3	1,418.1
1973	NA	NA	59,900	1,214.1	764.1	1,891.1
1974	NA	NA	65,000	1,617.0	1,017.9	2,480.5
1975	NA	NA	62,800	1,640.3	1,050.3	2,727.8
1976	NA	NA	58,100	1,664.1	852.3	2,496.2
1977(r)	917	306	59,400	1,866.1	1,047.7	2,812.7
1978	NA	NA	64,300	2,267.0	1,417.7	3,611.8
1979	NA	NA	69,100	2,833.8	1,736.9	4,389.0
1980	NA	NA	72,800	3,349.2	2,026.1	5,227.6
1981(r)	NA	NA	74,300	3,739.9	2,187.3	5,865.3
1982(r)	940	293	58,100	2,554.5	1,589.5	4,440.2
METAL FORMING MACHINE TOOL INDUSTRY, SIC 3542						
1958	291	147	22,502	$ 176.0	$ 130.1	$ 317.7
1963	366	146	22,078	281.3	165.4	441.4
1965	NA	NA	25,517	349.0	254.3	582.8
1966	NA	NA	28,407	432.1	311.9	727.7
1967	350	168	29,200	437.2	295.4	714.0
1968	NA	NA	27,900	453.3	270.0	718.2
1969	NA	NA	28,000	453.1	290.2	726.5
1970	NA	NA	28,900	469.6	328.6	776.1
1971	NA	NA	24,400	363.9	278.0	667.7
1972(r)	383	162	24,100	417.7	285.3	696.3
1973	NA	NA	27,000	546.5	370.8	886.2
1974	NA	NA	29,000	633.7	505.4	1,099.3
1975	NA	NA	26,000	618.3	483.2	1,106.6
1976	NA	NA	22,900	621.1	433.9	1,070.7
1977	426	163	23,700	721.9	444.0	1,130.6
1978	NA	NA	25,200	841.3	576.4	1,366.0
1979	NA	NA	27,000	1,004.0	687.0	1,663.5
1980	NA	NA	26,900	1,042.1	718.5	1,753.1
1981	NA	NA	24,000	976.5	662.7	1,615.7
1982(r)	452	162	19,500	777.8	574.6	1,428.7

NA - Not Available. *r* - Revised.

(a) The machine tool industry (Standard Industrial Classifications SIC 3541 and 3542) produces primarily metal cutting and metal forming machine tools. It also produces other (secondary) products, such as small cutting tools, attachments and accessories and others. These secondary products as well as machine tool parts and some other items are included in this table. It therefore differs from other Census and NMTBA data on shipments of machine tools.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1963, 1967, 1972, 1977, 1982 Metalworking Machinery and Equipment" and "Annual Survey of Manufactures."

LOCATION OF THE MACHINE TOOL INDUSTRY (c)
Establishments, Employees, Value Added, Shipments, by Region
1963 to 1982

Region	Establishments		Employees (Number)	Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees		(Million Dollars)	
U.S. TOTAL					
1963	1,167	415	83,136	$ 980	$1,502
1967	1,253	506	116,400	1,828	2,841
1972	1,277	437	76,600	1,319	2,114
1977	1,343	469	83,200	2,593	3,950
1982	1,392	455	77,600	3,332	5,869
NEW ENGLAND					
1963	150	52	16,934	183	273
1967	149	68	25,300	366	550
1972	140	52	2,000(a)	32(a)	48(a)
1977	155	56	D	56(a)	D
1982(d)	166	53	14,590E	D	D
MIDDLE ATLANTIC					
1963	251	68	11,618	148	212
1967	239	71	13,400	215	299
1972	218	64	10,400	175	270
1977	197	57	7,000(b)	205(b)	286(b)
1982(d)	178	53	12,100E	280(b)	424(b)
EAST NORTH CENTRAL					
1963	545	239	49,415	592	925
1967	578	270	67,500	1,100	1,764
1972	620	240	45,500	793	1,308
1977	595	252	48,200	1,535	2,389
1982(d)	565	228	39,200E	D	D
WEST NORTH CENTRAL					
1963	44	16	1,085	11	16
1967	46	22	2,600	38	57
1972	50	25	2,400	43	65
1977	52	23	D	D	D
1982(d)	104	37	6,810E	D	D
SOUTH					
1963	47	12	1,068	13	19
1967	61	29	3,200	44	63
1972	82	21	1,000(a)	19(a)	30(a)
1977	40	12	975E	5(b)	7(b)
1982(d)	71	22	1,630E	D	D
WEST					
1963	130	28	3,016	35	55
1967	180	46	4,400	67	109
1972	168	36	2,000(a)	39(a)	64(a)
1977	162	40	3,000E	65(b)	96(b)
1982(d)	165	32	2,910E	57(b)	100(b)

D - Withheld to avoid disclosure.   E - Estimate.

(a) Includes metal forming data only, metal cutting data withheld to avoid disclosure.

(b) Includes metal cutting data only, metal forming data withheld to avoid disclosure.

(c) Due to a change of methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(d) The regional data includes states with 500 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY (a)

General Statistics by Region

1963 to 1982

	Establishments			Value Added by Manufacturer	Value of Shipments
Region	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
U.S. TOTAL					
1963	801	269	61,058	$ 699	$1,061
1967	903	338	87,200	1,391	2,127
1972	894	275	52,500	902	1,418
1977	919	307	59,500	1,871	2,819
1982	940	293	58,100	2,555	4,440
NEW ENGLAND					
1963	111	39	14,853	160	238
1967	120	51	22,900	329	492
1972	109	40	D	D	D
1977	122	44	D	D	D
1982(b)	129	42	13,680E	D	D
MIDDLE ATLANTIC					
1963	163	40	7,106	89	120
1967	163	44	8,100	145	189
1972	145	35	6,500	115	166
1977	125	33	7,000	205	286
1982(b)	103	30	7,400	280	424
EAST NORTH CENTRAL					
1963	387	161	36,845	425	662
1967	428	191	49,900	824	1,303
1972	438	154	31,000	538	875
1977	440	179	34,600	1,105	1,717
1982(b)	397	156	28,300E	D	D
WEST NORTH CENTRAL					
1963	24	11	547	5	8
1967	26	10	1,600	25	36
1972	29	13	1,500	27	41
1977	28	13	D	D	D
1982(b)	83	28	5,710E	D	D
SOUTH					
1963	26	4	463	6	9
1967	37	15	2,200	31	41
1972	52	12	D	D	D
1977	17	2	200	5	7
1982(b)	63	17	1,410E	D	D
WEST					
1963	90	14	1,244	15	24
1967	129	27	2,500	38	66
1972	121	21	D	D	D
1977	104	18	1,700	65	96
1982(b)	111	14	1,600	57	100

D - Withheld to avoid disclosure. NA - Not Available.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 500 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY (a)
General Statistics by Region
1963 to 1982

	Establishments			Value Added by Manufacture	Value of Shipments
Region	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
U.S. Total					
1963	366	146	22,078	$281	$ 441
1967	350	168	29,200	437	714
1972	383	162	24,100	418	696
1977	426	163	23,700	722	1,131
1982	452	162	19,500	778	1429
NEW ENGLAND					
1963	39	13	2,081	23	35
1967	29	17	2,400	37	58
1972	31	12	2,000	32	48
1977	33	12	D	56	D
1982(b)	37	11	910E	D	D
MIDDLE ATLANTIC					
1963	88	28	4,512	59	92
1967	76	27	5,300	70	110
1972	73	29	3,900	60	104
1977	72	24	D	D	D
1982(b)	75	23	4,700E	D	D
EAST NORTH CENTRAL					
1963	158	78	12,570	167	264
1967	150	79	17,600	276	461
1972	182	86	14,500	256	433
1977	155	73	13,600	430	672
1982(b)	168	72	10,900E	D	D
WEST NORTH CENTRAL					
1963	20	5	538	6	8
1967	20	12	1,000	13	21
1972	21	12	900	16	24
1977	24	10	D	D	D
1982(b)	21	9	1,100E	D	D
SOUTH					
1963	21	8	605	7	10
1967	24	14	1,000	13	22
1972	30	9	1,000	19	30
1977	23	10	955E	D	D
1982(b)	8	5	220E	D	D
WEST					
1963	40	14	1,772	20	31
1967	51	19	1,900	29	43
1972	47	15	2,000	39	64
1977	58	22	1,300E	D	D
1982(b)	54	18	1,300E	D	D

D - Withheld to avoid disclosure. E - Estimate.

(a) Due to a change in methodology at the Bureau of Census some States' data are withheld, therefore regional data may not add to U.S. Total.

(b) The regional data includes states with 150 employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35(C)" and earlier issues. See chapter introduction.

LOCATION OF THE METAL CUTTING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1977 and 1982

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	95	16	1,500	$ 60	$ 89
Connecticut	46	18	4,600	148	234
Illinois	94	39	6,500	196	291
Indiana	25	8	1,400	39	57
Iowa	6	4	500	12	21
Massachusetts	37	10	2,200	66	92
Michigan	190	74	9,200	358	566
Minnesota	20	7	1,300	40	58
New Jersey	31	6	400	10	15
New York	52	16	4,700	148	204
Ohio	95	40	13,900	389	624
Pennsylvania	42	11	1,900	48	66
Rhode Island	20	7	2,400	62	82
Texas	17	2	200	5	7
Vermont	6	4	2,800	87	117
Washington	9	2	200	5	7
Wisconsin	36	18	3,700	128	180
STATE			1982(d)		
California	93	12	1,400	$ 50	$ 88
Connecticut	61	17	5,100	180	326
Florida	20	2	200	5	9
Illinois	90	30	5,400	208	358
Indiana	22	4	1,300	36	83
Iowa	4	2	(b)	D	D
Kansas	7	2	(b)	D	D
Kentucky	7	4	(b)	D	D
Maine	6	2	(b)	D	D
Massachusetts	35	11	2,600	114	176
Michigan	203	83	8,900	491	1,056
Minnesota	24	6	1,200	49	73
Missouri	7	1	200	3	8
New Hampshire	5	3	(c)	D	D
New Jersey	27	4	400	17	28
New York	42	14	4,900	176	275
North Carolina	8	4	200	8	22
Ohio	75	35	12,300	547	934
Pennsylvania	34	12	2,100	86	121
Rhode Island	16	5	(c)	D	D
South Carolina	5	2	(a)	D	D
South Dakota	3	2	(a)	D	D
Tennessee	3	1	(a)	D	D
Texas	22	6	(b)	D	D
Vermont	6	4	2,600	91	153
Virginia	5	2	(b)	D	D
Washington	18	2	200	7	12
Wisconsin	38	15	3,400	255	375

D - Withheld to avoid disclosure.

(a) 150 - 249 Employees.
(b) 250 - 499 Employees.
(c) 1,000 - 2,499 Employees.
(d) Data includes only states with 150 machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

LOCATION OF THE METAL FORMING MACHINE TOOL INDUSTRY
General Statistics by Selected States
1977 and 1982

	Establishments			Value Added by Manufacture	Value of Shipments
	Total	With 20 or More Employees	Employees (Number)	(Million Dollars)	
STATE			1977		
California	47	16	1,100	$ 37	$ 62
Colorado	8	4	400	10	17
Connecticut	24	10	1,800	50	72
Illinois	52	25	6,400	177	276
Indiana	11	7	600	18	31
Kansas	5	3	300	7	12
Michigan	58	22	2,000	68	110
Missouri	12	6	300	5	8
New York	29	11	2,200	65	96
Ohio	34	19	4,600	167	255
Pennsylvania	19	7	900	37	59
Texas	10	4	200	4	6
STATE			1982(d)		
California	42	13	1,000	$ 38	$ 79
Colorado	6	3	(a)	D	D
Connecticut	24	9	800	28	48
Illinois	56	25	4,400	232	397
Indiana	10	7	(b)	D	D
Kansas	5	3	300	10	19
Massachusetts	13	2	(a)	D	D
Michigan	55	22	1,600	67	117
Minnesota	5	2	(b)	D	D
Missouri	11	4	300	9	15
New Jersey	20	4	(b)	D	D
New York	31	9	1,700	49	91
North Carolina	4	3	(a)	D	D
Ohio	47	18	4,400	173	329
Pennsylvania	24	10	(c)	D	D
Virginia	4	2	(a)	D	D
Washington	6	2	200	8	12

D - Withheld to avoid disclosure.

(a) 150 - 249 Employees.
(b) 250 - 499 Employees.
(c) 1,000 - 2,499 Employees.
(d) Data includes only states with 150 machine tool employees or more.

Source: U.S. Bureau of the Census, "Census of Manufactures 1977, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C" and earlier issues. See chapter introduction.

THE MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1963	1967	1972	1977	1982(r)
Number of Companies	1,146	1,209	1,232	1,285	1,290
Number of Establishments	1,167	1,253	1,277	1,345	1,392
Number of Employees	83,136	116,400	76,600	83,100	77,600(e)
1 to 4 Employees					
Establishments	375	336	380	434	433
Employees	714	500	800	800	900
5 to 9 Employees					
Establishments	191	189	212	262	279
Employees	1,295	1,300	1,500	1,700	1,900
10 to 19 Employees					
Establishments	186	222	248	178	225
Employees	2,612	3,100	3,400	2,400	3,000
20 to 49 Employees					
Establishments	182	218	194	219	202
Employees	5,643	6,500	6,000	6,700	6,200
50 to 99 Employees					
Establishments	96	111	89	98	110
Employees	6,455	7,700	6,200	6,700	7,600
100 to 249 Employees					
Establishments	67	79	83	75	75
Employees	10,620	12,700	12,500	11,500	11,900
250 to 499 Employees					
Establishments	31	43	37	41	29
Employees	11,249	15,100	12,600	14,800	9,700
500 to 999 Employees					
Establishments	22	30	24	27	31
Employees	15,583	21,400	17,600	21,700(a)	22,100(a)
1000 to 2499 Employees					
Establishments	14	22	8	8	7
Employees	19,236	35,500	16,200(b)	16,600(b,d)	14,200(b,d)
2500 Employees or More					
Establishments	3	3	2	1	1
Employees	9,729	12,400	(c)	(c)	(c)
Covered by Administrative Records (f)					
Establishments	NA	330	355	673	740
Employees	NA	700	900	3,200	3,800

r - Revised. NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" (metal forming only) category.
(b) Includes only metal cutting to avoid disclosure.
(c) The number of employees is included in the "1000-2499 Employees" category.
(d) Also includes data for the "2500 Employees or More" (metal cutting only) category.
(e) Due to estimating procedures by the Census department, individual items may not add to total.
(f) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

THE METAL CUTTING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1963	1967	1972	1977	1982(r)
Number of Companies	784	865	857	874	860
Number of Establishments	801	903	894	919	940
Number of Employees	61,058	87,200	52,500	59,400	58,100
1 to 4 Employees					
Establishments	276	256	281	315	295
Employees	529	400	600	600	600
5 to 9 Employees					
Establishments	127	142	158	184	202
Employees	840	1,000	1,100	1,200	1,400
10 to 19 Employees					
Establishments	129	167	180	112	150
Employees	1,803	2,300	2,500	1,500	2,000
20 to 49 Employees					
Establishments	118	145	126	144	122
Employees	3,607	4,300	3,900	4,400	3,800
50 to 99 Employees					
Establishments	56	74	55	67	73
Employees	3,727	5,200	3,800	4,600	4,900
100 to 249 Employees					
Establishments	44	49	47	40	45
Employees	6,912	8,100	7,000	6,300	7,000
250 to 499 Employees					
Establishments	22	30	24	28	22
Employees	7,713	10,600	8,400	10,300	7,500
500 to 999 Employees					
Establishments	15	20	14	19	24
Employees	10,664	13,900	9,200	13,800	16,700
1000 to 2499 Employees					
Establishments	11	17	7	7	6
Employees	15,534	28,900	16,200(a)	16,600(a)	14,200(a)
2500 Employees or More					
Establishments	3	3	2	1	1
Employees	9,729	12,400	(b)	(b)	(b)
Covered by Administrative Records (c)					
Establishments	NA	245	265	455	545
Employees	NA	500	700	1,800	2,900

NA - Not Available. r - Revised.

(a) Also includes data for the "2500 Employees or More" category.
(b) The number of employees is included in the "1000-2499 Employees" category.
(c) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

THE METAL FORMING MACHINE TOOL INDUSTRY
By Employment Size of Establishment
For Selected Years

	1963	1967(b)	1972(b)	1977(b)	1982(b)
Number of Companies	362	344	375	411	430
Number of Establishments	366	350	383	426	452
Number of Employees	22,078	29,200	24,100	23,700	19,500
1 to 4 Employees					
Establishments	99	80	99	119	138
Employees	185	100	200	200	300
5 to 9 Employees					
Establishments	64	47	54	78	77
Employees	455	300	400	500	500
10 to 19 Employees					
Establishments	57	55	68	66	75
Employees	809	800	900	900	1,000
20 to 49 Employees					
Establishments	64	73	68	75	80
Employees	2,336	2,200	2,100	2,300	2,400
50 to 99 Employees					
Establishments	40	37	34	31	37
Employees	2,728	2,500	2,400	2,100	2,700
100 to 249 Employees					
Establishments	23	30	36	35	30
Employees	3,708	4,600	5,500	5,200	4,900
250 to 499 Employees					
Establishments	9	13	13	13	7
Employees	3,536	4,500	4,200	4,500	2,200
500 to 999 Employees					
Establishments	7	10	10	8	7
Employees	4,919	7,500	8,400(a)	7,900(a)	5,400(a)
1000 to 2499 Employees					
Establishments	3	5	1	1	1
Employees	3,702	6,600	(c)	(c)	(c)
2500 Employees or More					
Establishments	—	—	—	—	—
Employees	—	—	—	—	—
Covered by Administrative Records (d)					
Establishments	NA	85	90	218	195
Employees	NA	200	200	1,400	900

NA - Not Available.

(a) Also includes data for the "1000 to 2499 Employees" category.
(b) Due to estimating procedures by the Census department, individual items may not add to total.
(c) The number of employees is included in the "500-999 Employees" category.
(d) See chapter 3 introduction for an explanation.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82-1-35C," and earlier issues. See chapter introduction.

INVENTORIES OF THE MACHINE TOOL INDUSTRY
End of Year, Selected Years, 1967 to Date
(Millions of Dollars)

	Total Machine Tool Industry	Metal Cutting SIC 3541	Metal Forming SIC 3542
TOTAL INVENTORIES			
1967	$ 743.1	$ 535.3	$207.8
1971	726.0	492.8	233.2
1972	724.9	482.2	242.7
1973	885.7	591.9	293.8
1974	1,150.0	786.2	363.8
1975	1,100.4	737.9	362.5
1976	1,048.3	735.4	312.9
1977	1,238.0	878.4	359.6
1978	1,434.0	1,012.3	421.7
1979	1,689.2	1,242.2	447.0
1980	1,874.6	1,419.4	455.2
1981(r)	2,359.1	1,764.9	594.2
1982	1,943.1	1,431.6	511.5
Finished Products			
1967	158.9	112.1	46.8
1971	186.1	123.2	62.9
1972	173.6	112.8	60.7
1973	174.7	111.0	63.7
1974	223.8	148.3	75.5
1975	244.6	166.0	78.6
1976	233.5	168.9	64.6
1977	264.7	184.2	80.5
1978	282.4	199.7	82.7
1979	312.1	222.3	89.8
1980	354.1	253.5	100.6
1981(r)	507.1	343.6	163.5
1982	501.0	355.6	145.4
Work in Process			
1967	442.0	329.5	112.5
1971	385.5	278.3	107.2
1972	395.2	279.8	115.4
1973	521.2	371.4	149.8
1974	678.2	492.6	185.6
1975	618.1	447.7	170.4
1976	596.3	443.8	152.5
1977	717.6	537.5	180.1
1978	868.5	642.3	226.2
1979	1,042.8	812.5	230.3
1980	1,220.3	989.4	230.9
1981(r)	1,413.2	1,117.4	295.8
1982	1,047.1	809.5	237.6
Materials, Supplies, Fuel, Etc.			
1967	142.2	93.7	48.5
1971	154.4	91.3	63.1
1972	156.2	89.6	66.6
1973	189.8	109.5	80.3
1974	248.0	145.3	102.7
1975	237.7	124.2	113.5
1976	218.4	122.7	95.7
1977	255.7	156.7	99.1
1978	283.1	170.3	112.8
1979	334.3	207.4	126.9
1980	300.0	176.4	123.6
1981(r)	438.7	303.8	134.9
1982	395.0	266.5	128.5

r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures, 1982 Industry Series: Metalworking Machinery and Equipment, MC82(1)-35C" and earlier issues; U.S. Bureau of the Census, "Annual Survey of Manufactures." See chapter introduction.

PRODUCTS OF THE METAL CUTTING AND FORMING INDUSTRIES
Selected Years
(Values in Million of Dollars)

Industry and Year Metal Cutting Industry (3541)	TOTAL SHIPMENTS	Metal Cutting Machine Tools	Secondary Products	Miscellaneous Receipts	% Primary Product Specialization
1967	$2,127.2	$1,715.7	$269.7	$141.8	86%
1972	1,418.1	1,135.5	188.9	93.7	86
1977(r)	2,812.7	2,353.9	337.0	121.8	87
1982(r)	4,440.2	3,877.2	369.5	193.6	91
1967	$ 714.0	$ 568.4	$ 99.5	$ 46.1	85%
1972	696.3	583.6	73.1	39.6	89
1977	1,130.6	967.1	111.6	51.9	90
1982(r)	1,428.7	1,210.5	143.6	74.6	89

r - Revised.

Note: "Primary Product Specialization" is arrived at by dividing "Primary Products" by "Primary Products plus Secondary Products."

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982; Industry Series: Metalworking Machinery and Equipment MC82-1-35C" and earlier issues. See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
Quantity Used

Material	Unit of Measure	Metal Cutting Industry			Metal Forming Industry		
		1972	1977	1982	1972	1977	1982
MILL SHAPES							
Carbon Steel	Short Ton	85,900(i)	NA	NA	139,100(j)	113,400(a)	52,500(q)
Stainless Steel	Short Ton	900	NA	NA	500	100(m)	NA
Other Alloy Steel	Short Ton	24,500	20,000(o)	NA	9,600	12,000(n)	NA
Copper and Alloy	000 Lbs.	600(h,k)	3,800(d,h)	NA	300(k)	800(k)	NA
Aluminum and Alloy	000 Lbs.	1,400(b)	NA	NA	NA	1,100	NA
Iron and Steel Scrap	Short Ton	20,100	6,500	NA	D	NA	D
CASTINGS (Rough and Semifinished)							
Iron (Gray & Malleable)	Short Ton	69,900	77,900(p)	7,300(r)	36,500	NA	D
Steel	Short Ton	NA	NA	D	11,100	12,400(p)	D
Aluminum and Alloy	000 Lbs.	NA	NA	D	700	2,600(p)	0
Copper and Alloy	000 Lbs.	1,100	1,700(p)	0	2,600	NA	0
IRON AND STEEL FORGINGS							
Iron & Steel Forgings	Short Ton	4,700	5,900(p)	NA	7,500	8,200(p)	NA
ELECTRIC MOTORS AND GENERATORS							
Fractional	Number	96,300(c)	1,900(l,p)	D	900(1)	1,900(1,p)	0
Integral	Number	NA	NA	900(r)	NA	NA	D

NA - Not Available. D - Withheld to avoid disclosure.

(a) Excludes structural shapes and all other carbon steel.
(b) Sheet and extrusion only.
(c) Excludes timing motors.
(d) Insulated wire and cable only.
(e) Excludes wire and wire products and sheet and strip.
(f) Excludes plate, sheet and strip and pipe and tube.
(g) Sheet and plate only.
(h) Bare wire only.
(i) Bars and bar shapes, sheet and strip, and plates only.
(j) Bars and bar shapes, sheet and strip, plates, and structural shapes only.
(k) Rod, bar, and mechanical wire and plate, sheet, and strip only.
(l) Timing motors only.
(m) Sheet and strip only.
(n) Excludes bars and bar shapes.
(o) Bars and bar shapes only.
(p) Purchased only.
(q) Plates only.
(r) Produced & Consumed only, no Purchases.

Source: U.S. Bureau of the Census, "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment." See chapter introduction.

SELECTED MATERIALS CONSUMED
By the Machine Tool Industry, Selected Years
(Million of Dollars)

	Metal Cutting Industry			Metal Forming Industry		
Material	1972	1977	1982	1972	1977	1982
GRAND TOTAL	$454.3	$904.4	$1,380.0	$253.4	$395.7	$512.8
MILL SHAPES						
Carbon Steel	34.4	63.1	69.6	36.7	58.3	58.0
Stainless Steel	3.2	3.0	1.6	.6	.7	.8
Other Alloy Steel	15.5	23.2	18.8	7.0	12.1	7.5
Copper and Alloy	3.5	5.5	8.2	1.1(a)	2.4(c)	19.0
Aluminum and Alloy	1.4	1.7	3.4	0.8	2.7	.5(b)
Iron and Steel Scrap	.9	1.1	2.3	D	.7	.3
CASTINGS (Rough and Semifinished)						
Iron (Gray and Malleable)	43.6	84.5	86.0	18.1	29.4	27.0
Steel	4.4	8.7	54.6	8.9	18.8	16.6
Aluminum and Alloy	4.1	6.0	3.0	.8	2.9	2.4
Copper and Alloy	1.2	2.5	1.2	2.9	1.5	2.9
IRON AND STEEL FORGINGS						
Iron and Steel Forgings	4.3	8.7	15.4	6.1	11.3	13.8
ELECTRICAL MOTORS AND GENERATORS						
Fractional	4.3	7.0	26.8	.6	2.7	5.1
Integral	16.3	26.3	35.1	6.6	12.6	6.7
BEARINGS						
Ball and Roller	13.2	18.6	25.9	3.7	7.6	9.5
ALL OTHER MATERIALS						
Components, Parts, Etc.	227.0	478.6	753.6	114.7	151.7	174.3
NO BREAKDOWN FURNISHED						
Materials, Parts, Containers and Supplies	77.0	165.9	272.5	44.8	80.3	166.9

D - Withheld to avoid disclosure.

(a) Excludes bare wire, pipe and tube.
(b) Sheet, plate and foil only.
(c) Excludes plate, sheet and strip.

Source: U.S. Bureau of the Census "Census of Manufactures, 1982, 1977, 1972: Industry Series: Metalworking Machinery and Equipment," and earlier issues. See chapter introduction.

U. S. MACHINE TOOL SHIPMENTS AND ORDERS

This chapter deals with machine tool products shipped by the machine tool industry and other industries.

Up and Down Performance

The machine tool business is highly cyclical, a fact evidenced by historical patterns of new orders, shipments and order backlogs. The dramatic ups and downs in the value of shipments and orders tend to obscure significant changes in the "product mix;" the share of the total comprised by the different major machine tool product categories.

One of the more notable of these changes is the increased share of "other machines" in metal cutting machine tool shipments. This category's share of output has risen from 15-20% in the late 1950's and early 1960's to more than twice that level in recent years. The reason for this dramatic rise is that this group includes station type machines and multi-function NC machines (machining centers). As such, its increased market share demonstrates parallel yet divergent trends ongoing in American metalworking.

Station type machines are highly specialized, dedicated machines, designed to produce one part in volumes of up to hundreds of thousands per year. They are the model of efficiency through the use of dedicated mass production. Machining centers, on the other hand, represent efficiency through flexibility. By virtue of their tool changing capability and their numerical control - in which a part-making program maintains the production process rather than manual control - these machines can be easily reprogrammed to produce a variety of parts.

These are only two examples of how machine tool technology and America's machine tool builders have responded to the changing metalworking needs of America's manufacturers.

Data Sources

Census and Annual Survey of Manufactures

The broadest coverage of machine tool shipment data is provided by the Census of Manufactures and the Annual Surveys of Manufactures. Included in these reports are statistics for: most of the major categories of metal cutting machine tools (boring, drilling, gear cutting, presses, etc.), machine tools primarily designed for home workshops and laboratories, parts sold separately, and machine tools originating primarily from small-sized plants-not specified by kind. Broad coverage is given to both metal cutting and metal forming machine tools in these reports.

The comprehensive Census of Manufactures is taken every five years (those ending in 2 and 7) and the Annual Survey of Manufactures is published in non-Census years. The charts and tables in this chapter were updated with published revised reports from the 1982 Census of Manufactures.

There are two other sources of machine tool shipment data widely used by students of the industry. One is the monthly order and shipment series published by NMTBA. The other is the quarterly "Current Industrial Report, Metalworking Machinery" (MQ35W), published by the U.S. Department of Commerce. The MQ-35W provides more detailed coverage of shipments by product types than either the Census or Survey of Manufactures. Both the MQ-35W and the NMTBA estimates are more timely and are published more frequently than the Census or Annual Survey.

NMTBA Estimate of Orders and Shipments

The NMTBA "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" is published monthly, normally three or four weeks after the end of the month reported. This report differs from the broader Census report in that it is limited to complete machine tools and excludes the value of: (a) machine tools costing under $2,500, (b) machine tools designed for home workshops, etc., (c) rebuilt machines and (d) parts sold separately.

Machine tool manufacturers representing more than two-thirds of total U.S. machine tool shipments participate in the NMTBA survey. The figures received each month from respondents are expanded, based on "benchmark" totals derived from the MQ-35W reports, to an estimate of the industry total by NMTBA's Statistical Department.

The MQ-35W Report

The "Current Industrial Report, Metalworking Machinery" (MQ-35W) is published quarterly, usually about three months after the end of the quarter reported, by the Bureau of the Census.

The report covers the number and value of total machine tools shipped, by 5- and 7-digit SIC categories, for more than 120 different machine tool products. It does not report new orders but does report unfilled orders.

The report is limited to information on complete new machine tools, excluding data for small machine tools designed for home use, etc., and data for rebuilt machines. It lists separately machines with a value of $2,500 and over, and those with a value under $2,500. The MQ-35W figures, excluding machine tools with an average value under $2,500, form the benchmark used for the NMTBA "Industry Estimate."

The MQ-35W report also provides data on numerically controlled machine tools and on manufacturers' exports. It is intended to cover all manufacturers of machine tool products, including those who produce machine tools for their own use but not for sale in the marketplace, and thus to cover all shipments.

SHIPMENTS
Metal Cutting and Metal Forming Machine Tools, 1956 to Date

(Millions of Dollars)

Year	TOTAL			Metal Cutting			Metal Forming		
	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,377	$1,270	$107	$ 945	$ 858	$ 87	$ 432	$412	$ 20
1957	1,243	1,110	133	900	803	97	343	307	36
1958	591	507	84	438	381	57	153	126	27
1959	616	538	78	441	390	51	175	148	27
1960	744	580	164	541	420	121	203	160	43
1961	751	522	229	541	366	175	210	156	54
1962	821	606	215	613	450	163	208	156	52
1963	896	741	155	639	526	113	257	215	42
1964	1,164	959	205	845	679	166	319	280	39
1965	1,426	1,249	177	1,023	886	137	403	363	40
1966	1,685	1,535	150	1,222	1,098	124	463	437	26
1967	1,806	1,618	188	1,353	1,211	142	453	407	46
1968	1,727	1,563	164	1,358	1,238	120	369	325	44
1969	1,597	1,446	151	1,192	1,077	115	405	369	36
1970	1,443	1,239	204	993	827	166	450	412	38
1971	998	840	158	672	554	118	326	286	40
1972	1,019	894	124	714	627	87	304	267	37
1973	1,501	1,323	178	1,074	935	139	427	388	39
1974	2,031	1,763	267	1,445	1,241	205	585	522	63
1975	2,452	2,033	419	1,879	1,548	331	573	484	89
1976	2,060	1,744	316	1,482	1,270	212	578	474	104
1977	2,281	2,030	251	1,651	1,470	181	630	560	70
1978	3,013	2,689	325	2,189	1,960	228	825	729	96
1979	3,877	3,465	411	2,930	2,605	325	947	860	87
1980	4,692	4,084	608	3,681	3,206	475	1,011	878	133
1981	5,096	4,377	719	4,105	3,553	552	991	824	167
1982	3,604	3,198	406	2,895	2,599	296	710	600	110
1983	1,845	1,630	215	1,372	1,200	172	474	430	43
1984	2,286	2,093	193	1,607	1,484	123	679	609	71

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS

Metal Cutting and Metal Forming Machine Tools, 1956 to Date

(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	Total	Domestic	Foreign
1956	$1,298	$1,172	$126	$ 983	$ 882	$101	$ 315	$290	$ 25
1957	722	644	78	552	491	61	170	153	17
1958	427	350	77	299	247	52	128	103	25
1959	748	644	104	541	471	70	207	173	34
1960	744	527	217	535	375	160	209	152	57
1961	772	536	236	591	401	190	181	135	46
1962	815	661	154	571	468	103	244	193	51
1963	1,061	869	192	760	607	153	301	262	39
1964	1,577	1,348	229	1,038	861	177	539	487	52
1965	1,692	1,532	160	1,251	1,122	129	441	410	31
1966	2,074	1,884	190	1,629	1,483	146	445	401	44
1967	1,420	1,272	148	1,134	1,024	110	286	248	38
1968	1,474	1,320	154	1,080	960	120	394	360	34
1969	1,728	1,517	211	1,195	1,033	162	533	484	49
1970	912	733	179	651	507	144	261	226	35
1971	861	747	114	609	524	85	252	223	[illegible]
1972	1,412	1,245	167	1,009	877	132	403	368	35
1973	2,613	2,268	345	1,825	1,550	275	787	717	70
1974	2,583	2,185	398	2,017	1,716	301	566	470	96
1975	1,277	1,064	213	916	781	135	361	284	77
1976	2,203	1,961	242	1,662	1,477	185	541	485	56
1977	2,995	2,709	286	2,202	1,981	221	793	729	64
1978	4,349	3,944	405	3,375	3,043	332	973	901	72
1979	5,621	4,856	765	4,495	3,866	629	1,126	991	135
1980	4,754	4,239	515	3,885	3,496	389	870	744	126
1981	2,945	2,563	382	2,228	1,946	282	717	617	100
1982	1,498	1,261	236	1,064	890	175	433	372	62
1983	1,696	1,558	138	1,152	1,069	82	545	489	56
1984	2,916	2,631	285	1,916	1,700	216	1,000	932	69

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS
Metal Cutting and Metal Forming Machine Tools, 1959 to Date
(Millions of Dollars)

	TOTAL			Metal Cutting			Metal Forming		
Year	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders	Gross New Orders	Cancellations	Net New Orders
1959	$ 769	$ 21	$ 748	$ 559	$ 18	$ 541	$ 210	$ 3	$ 207
1960	790	46	744	571	36	535	219	10	209
1961	808	36	772	621	30	591	187	6	181
1962	852	37	815	603	32	571	249	5	244
1963	1,099	38	1,061	790	30	760	309	8	301
1964	1,652	75	1,577	1,084	46	1,038	568	29	539
1965	1,771	79	1,692	1,312	61	1,251	459	18	441
1966	2,217	143	2,074	1,737	108	1,629	480	35	445
1967	1,614	194	1,420	1,292	158	1,134	322	36	286
1968	1,631	157	1,474	1,216	136	1,080	415	21	394
1969	1,910	182	1,728	1,332	137	1,195	578	45	533
1970	1,060	148	912	757	106	651	303	42	261
1971	933	72	861	655	46	609	278	25	252
1972	1,465	53	1,412	1,051	42	1,009	414	11	403
1973	2,773	160	2,613	1,958	132	1,825	815	28	787
1974	2,970	387	2,583	2,283	266	2,017	687	121	566
1975	1,651	374	1,277	1,198	282	916	453	92	361
1976	2,370	167	2,203	1,793	131	1,662	578	37	541
1977	3,153	158	2,995	2,329	127	2,202	824	31	793
1978	4,573	224	4,349	3,559	184	3,375	1,013	40	973
1979	6,063	442	5,621	4,873	378	4,495	1,190	64	1,126
1980	5,381	627	4,754	4,436	551	3,885	946	76	870
1981	3,585	640	2,945	2,799	571	2,228	786	69	717
1982	1,934	437	1,498	1,467	402	1,064	468	34	433
1983	1,890	194	1,696	1,328	177	1,152	561	17	545
1984	3,044	128	2,916	2,005	90	1,915	1,038	38	1,000

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments, and Backlog" (monthly).

UNFILLED ORDERS
Metal Cutting and Metal Forming Machine Tools, 1957 to Date
(Millions of Dollars)

As of December 31	Total	Metal Cutting	Metal Forming	As of December 31	Total	Metal Cutting	Metal Forming
1957	$ 471	$ 388	$ 83	1971	$ 569	$ 408	$162
1958	308	249	59	1972	963	702	261
1959	443	350	93	1973	2,074	1,454	621
1960	444	344	100	1974	2,625	2,025	600
1961	467	394	73	1975	1,450	1,062	388
1962	463	354	109	1976	1,594	1,243	351
1963	628	475	153	1977	2,308	1,794	515
1964	1,043	669	374	1978	3,643	2,981	663
1965	1,311	899	412	1979	5,388	4,546	843
1966	1,701	1,307	394	1980	5,451	4,750	701
1967	1,317	1,089	228	1981	3,300	2,873	427
1968	1,064	810	295	1982	1,194	1,043	151
1969	1,195	812	424	1983	1,045	823	222
1970	706	471	235	1984	1,675	1,132	542

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

METAL CUTTING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

(Millions of Dollars)

Year	TOTAL Gross New Orders	TOTAL Cancellations	TOTAL Net New Orders	Domestic Gross New Orders	Domestic Cancellations	Domestic Net New Orders	Foreign Gross New Orders	Foreign Cancellations	Foreign Net New Orders
1956	$1,052	$ 69	$ 983	$ 946	$ 64	$ 882	$106	$ 5	$101
1957	618	66	552	555	64	491	63	2	61
1958	317	18	299	265	18	247	52	0	52
1959	559	18	541	486	15	471	73	3	70
1960	571	36	535	408	33	375	163	3	160
1961	621	30	591	425	24	401	196	6	190
1962	603	32	571	494	26	468	109	6	103
1963	790	30	760	632	25	607	158	5	153
1964	1,084	46	1,038	896	35	861	188	11	177
1965	1,312	61	1,251	1,175	53	1,122	137	8	129
1966	1,737	108	1,629	1,580	97	1,483	157	11	146
1967	1,292	158	1,134	1,173	149	1,024	119	9	110
1968	1,216	136	1,080	1,091	131	960	125	5	120
1969	1,332	137	1,195	1,160	127	1,033	172	10	162
1970	757	106	651	605	99	506	152	7	145
1971	655	46	609	565	41	524	90	5	85
1972	1,051	42	1,009	916	39	877	135	3	132
1973	1,953	132	1,825	1,675	124	1,550	283	8	275
1974	2,283	266	2,017	1,959	243	1,716	324	23	301
1975	1,198	282	916	1,027	247	780	171	35	136
1976	1,793	131	1,662	1,594	117	1,477	199	14	185
1977	2,329	127	2,202	2,095	114	1,981	234	13	221
1978	3,559	184	3,375	3,203	160	3,043	356	24	332
1979	4,873	378	4,495	4,202	337	3,866	671	42	629
1980	4,436	551	3,885	3,986	490	3,496	450	61	389
1981	2,799	571	2,228	2,476	530	1,946	323	41	282
1982	1,467	402	1,064	1,262	373	890	204	30	175
1983	1,328	177	1,152	1,236	167	1,069	92	10	82
1984	2,005	90	1,916	1,780	80	1,700	226	9	216

Individual items may not add to totals due to rounding.

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly)

METAL FORMING GROSS NEW ORDERS, CANCELLATIONS, AND NET NEW ORDERS

Domestic & Foreign, 1956 to Date

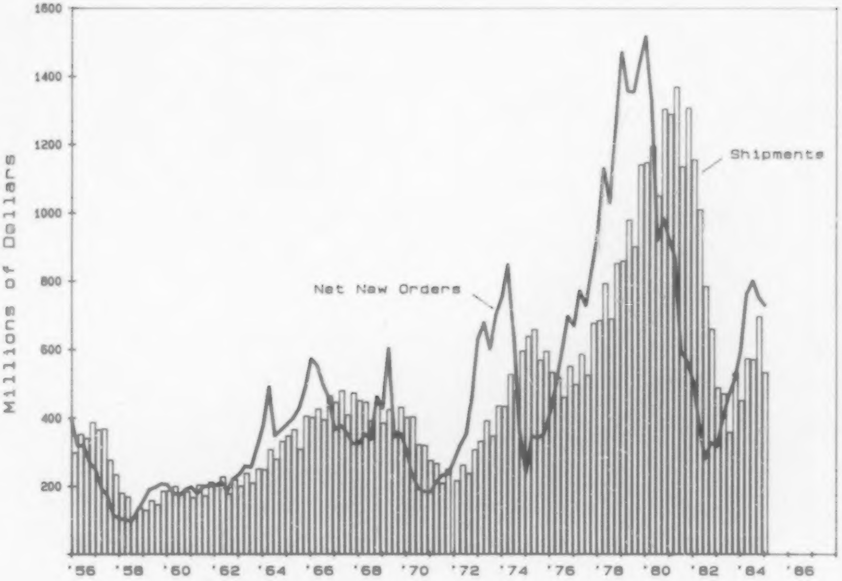
(Millions of Dollars)

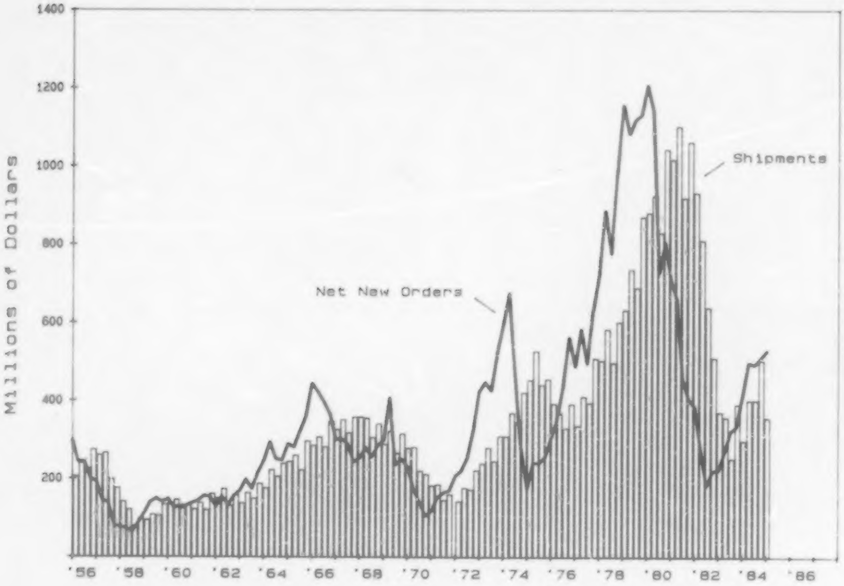
	TOTAL			Domestic			Foreign		
Year	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders	Gross New Orders	Cancel-lations	Net New Orders
1956	$ 340	$ 25	$ 315	$ 314	$ 24	$290	$ 26	$ 1	$ 25
1957	181	11	170	164	11	153	17	0	17
1958	134	6	128	108	5	103	26	1	25
1959	210	3	207	175	2	173	35	1	34
1960	219	10	209	161	9	152	58	1	57
1961	187	6	181	139	4	135	48	2	46
1962	249	5	244	197	4	193	52	1	51
1963	309	8	301	269	7	262	40	1	39
1964	568	29	539	511	24	487	57	5	52
1965	459	18	441	427	17	410	32	1	31
1966	480	35	445	434	33	401	46	2	44
1967	322	36	286	281	33	248	41	3	38
1968	415	21	394	380	20	360	35	1	34
1969	578	45	533	527	43	484	51	2	49
1970	303	42	261	265	38	227	38	4	34
1971	278	25	252	244	21	223	34	4	29
1972	414	11	403	378	10	368	36	1	35
1973	815	28	787	742	25	717	73	3	70
1974	687	121	566	583	113	470	105	8	96
1975	453	92	361	364	81	284	89	12	77
1976	578	37	541	513	28	485	64	8	56
1977	824	31	793	757	29	729	67	2	64
1978	1,013	40	973	938	37	901	75	3	72
1979	1,190	64	1,126	1,048	57	991	142	7	136
1980	946	76	870	814	70	744	132	6	126
1981	786	69	717	680	63	617	106	6	100
1982	468	34	433	399	28	372	68	7	62
1983	561	17	545	503	14	489	58	2	56
1984	1,038	38	1,000	967	36	932	71	3	69

Individual items may not add to totals due to rounding.

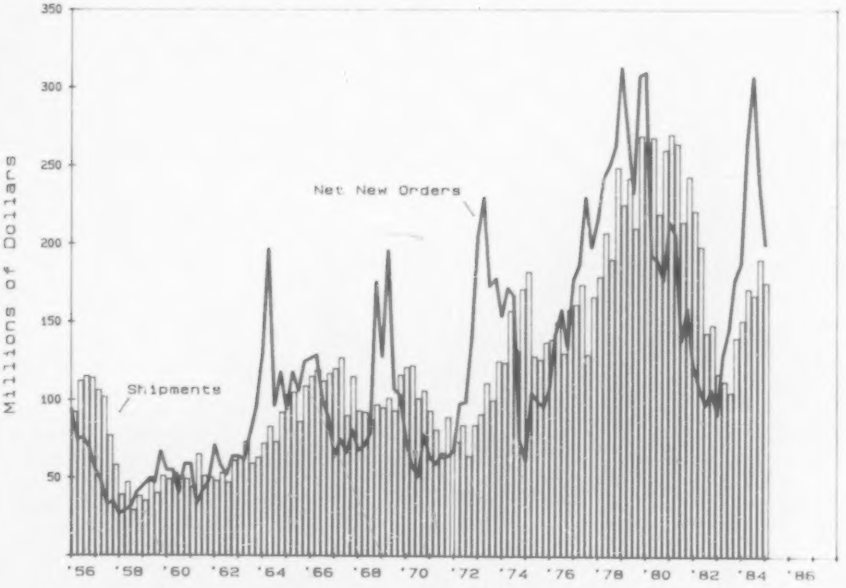
Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

Total Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956: 1 to 1985: 1





Metal Cutting Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956: 1 to 1985: 1



Metal Forming Machine Tools
Shipments (Bar) and Net New Orders (Line)
Quarterly, 1956: 1 to 1985: 1

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1956-1962
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 274,100	$ 23,750	$187,700	$ 18,550	$ 86,400	$ 5,200
2	326,100	25,600	218,700	21,150	107,400	4,450
3	319,200	21,100	208,100	17,350	111,100	3,750
4	350,900	36,550	243,700	29,950	107,200	6,600
Total	$1,270,300	$107,000	$858,200	$ 87,000	$412,100	$20,000
1957-1 qtr.	$ 331,900	$ 33,350	$232,950	$ 26,650	$ 98,950	$ 6,700
2	325,700	41,900	236,150	29,650	89,550	12,250
3	248,050	28,350	179,300	19,800	68,750	8,550
4	204,700	28,750	155,150	20,500	49,550	8,250
Total	$1,110,350	$132,350	$803,550	$ 96,600	$306,800	$35,750
1958-1 qtr.	$ 160,050	$ 19,900	$125,500	$ 15,400	$ 34,550	$ 4,500
2	141,800	25,700	105,050	15,750	36,750	9,950
3	90,300	17,450	65,400	13,050	24,900	4,400
4	115,000	21,000	85,150	13,100	29,850	7,900
Total	$ 507,150	$ 84,050	$ 381,100	$ 57,300	$126,050	$26,750
1959-1 qtr.	$ 108,200	$ 20,750	$ 79,300	$ 14,900	$ 28,900	$ 5,850
2	137,450	19,550	95,450	12,050	42,000	7,500
3	130,650	14,400	95,050	10,000	35,600	4,400
4	162,000	23,000	120,050	13,800	41,950	9,200
Total	$ 538,300	$ 77,700	$389,850	$ 50,750	$148,450	$26,950
1960-1 qtr.	$ 159,550	$ 25,950	$117,700	$ 18,700	$ 41,850	$ 7,250
2	160,400	38,500	116,950	28,750	43,450	9,750
3	136,950	38,650	96,350	28,450	40,600	10,200
4	123,950	60,050	89,750	44,850	34,200	15,200
Total	$ 580,850	$163,150	$420,750	$120,750	$160,100	$42,400
1961-1 qtr.	$ 116,150	$ 50,100	$ 83,650	$ 38,550	$ 32,500	$11,550
2	146,450	56,650	95,900	42,550	50,550	14,100
3	117,200	53,750	80,250	39,800	36,950	13,950
4	142,850	67,750	106,750	53,800	36,100	13,950
Total	$ 522,650	$228,250	$366,550	$174,700	$156,100	$53,550
1962-1 qtr.	$ 140,250	$ 57,700	$106,100	$ 43,900	$ 34,150	$13,800
2	159,750	66,950	121,150	53,050	38,600	13,900
3	136,200	41,250	98,400	32,400	37,800	8,850
4	169,850	49,300	124,400	33,450	45,450	15,850
Total	$ 606,050	$215,200	$450,050	$162,800	$156,000	$52,400

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS

Quarterly and Yearly, 1963-1969

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963-1 qtr.	$ 163,100	$ 36,850	$ 112,600	$ 24,650	$ 50,500	$12,200
2	203,300	33,500	140,550	23,600	62,750	9,900
3	173,000	36,150	122,450	27,450	50,550	8,700
4	201,850	48,000	51,400	36,700	51,400	11,300
Total	$ 741,250	$154,500	$ 526,050	$112,400	$215,200	$42,100
1964-1 qtr.	$ 197,250	$ 50,700	$ 135,900	$ 40,550	$ 61,350	$10,150
2	259,800	46,700	183,550	39,850	76,250	6,850
3	231,200	47,950	170,400	35,700	60,800	12,250
4	271,500	59,250	189,300	49,400	82,200	9,850
Total	$ 959,750	$204,600	$ 679,150	$165,500	$280,600	$39,100
1965-1 qtr.	$ 304,100	$ 42,600	$ 209,850	$ 34,150	$ 94,250	$ 8,450
2	319,850	45,700	225,200	35,100	94,650	10,600
3	271,300	36,700	193,700	27,850	77,600	8,850
4	353,550	51,800	257,100	39,600	96,450	12,200
Total	$1,248,800	$176,800	$ 885,850	$136,700	$362,950	$40,100
1966-1 qtr.	$ 361,650	$ 39,000	$ 253,900	$ 31,350	$107,750	$ 7,650
2	389,700	36,150	277,200	30,150	112,500	6,000
3	361,950	32,300	256,800	25,150	105,150	7,150
4	421,050	43,400	309,600	37,600	111,450	5,800
Total	$1,534,350	$150,850	$1,097,500	$124,250	$436,850	$26,600
1967-1 qtr.	$ 399,500	$ 11,050	$ 289,750	$ 35,900	$109,750	$10,000
2	428,850	50,750	315,450	36,250	113,400	14,050
3	367,350	45,900	287,200	30,800	80,150	10,250
4	422,250	50,300	318,650	39,200	103,600	11,550
Total	$1,617,950	$188,000	$1,211,050	$142,150	$406,900	$45,850
1968-1 qtr.	402,200	$ 48,250	$ 321,500	$ 36,000	$ 80,700	$12,250
2	392,800	53,550	313,850	40,950	78,950	12,600
3	361,750	29,550	282,900	21,650	78,850	7,900
4	406,000	32,800	320,050	21,400	85,950	11,400
Total	$1,562,750	$164,150	$1,238,300	$120,000	$324,450	$44,150
1969-1 qtr.	$ 353,500	$ 30,600	$ 268,100	$ 21,350	$ 85,400	$ 9,250
2	384,300	38,450	293,250	28,500	91,050	9,950
3	321,950	37,800	234,850	31,450	87,100	6,350
4	387,000	43,950	281,250	33,700	105,750	10,250
Total	$1,446,750	$150,800	$1,077,450	$115,000	$369,300	$35,800

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS
Quarterly and Yearly, 1970-1976
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970-1 qtr.	$ 351,950	$ 48,700	$ 241,500	$ 37,900	$110,450	$ 10,800
2	348,000	54,800	236,200	44,550	111,800	10,250
3	269,350	51,600	176,050	44,350	93,300	7,250
4	269,650	49,000	173,600	38,750	96,050	10,250
Total	$1,238,950	$204,100	$ 827,350	$165,550	$411,600	$ 38,550
1971-1 qtr.	$ 228,500	$ 46,300	$ 142,900	$ 39,000	$ 85,600	$ 7,300
2	228,350	37,900	154,200	30,850	74,150	7,050
3	173,000	35,100	120,300	24,800	52,700	10,300
4	209,950	38,800	136,800	23,450	73,150	15,350
Total	$ 839,800	$158,100	$ 554,200	$118,100	$285,600	$ 40,000
1972-1 qtr.	$ 183,750	$ 31,550	$ 121,900	$ 20,850	$ 61,850	$ 10,700
2	229,550	31,050	155,650	21,100	73,900	9,950
3	209,300	27,050	151,300	21,200	58,000	5,850
4	271,750	34,700	196,300	24,150	73,450	10,550
Total	$ 894,350	$124,350	$ 627,150	$ 87,300	$267,200	$ 37,050
1973-1 qtr.	$ 295,050	$ 35,500	$ 209,950	$ 29,400	$ 85,100	$ 6,100
2	347,500	43,200	243,750	36,050	103,750	7,150
3	296,650	48,950	207,450	37,850	89,200	11,100
4	383,900	50,250	273,900	35,400	110,000	14,850
Total	$1,323,100	$177,900	$ 935,050	$138,700	$388,050	$ 39,200
1974-1 qtr.	$ 378,550	$ 54,750	$ 269,850	$ 39,400	$108,700	$ 15,350
2	464,250	61,350	323,800	44,850	140,450	16,500
3	408,800	69,350	291,000	54,700	117,800	14,650
4	511,550	81,950	356,700	65,550	154,850	16,400
Total	$1,763,150	$267,400	$1,241,350	$204,500	$521,800	$ 62,900
1975-1 qtr.	$ 526,550	$109,700	$ 375,400	$ 78,400	$151,150	$ 31,300
2	554,750	101,400	443,450	84,550	111,300	16,850
3	467,150	99,650	361,850	79,050	105,300	20,600
4	484,150	108,350	367,400	88,550	116,750	19,800
Total	$2,032,600	$419,100	$1,548,100	$330,550	$484,500	$88,550
1976-1 qtr.	$ 446,550	$ 85,300	$ 334,150	$ 58,500	$112,400	$ 26,800
2	425,400	92,450	302,100	65,750	123,300	26,700
3	393,450	66,900	284,850	45,100	108,600	21,800
4	477,950	71,650	348,750	42,900	129,200	28,750
Total	$1,743,350	$316,300	$1,269,850	$212,250	$473,500	$104,050

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOLS

Quarterly and Yearly, 1977 to Date

(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977-1 qtr.	$ 433,800	$ 63,100	$ 297,550	$ 38,550	$136,250	$ 24,550
2	526,300	58,400	365,650	45,150	160,650	13,250
3	476,000	48,050	359,300	35,850	116,700	12,200
4	594,100	81,000	447,350	61,400	146,750	19,600
Total	$2,030,200	$250,550	$1,469,850	$180,950	$560,350	$ 69,600
1978-1 qtr.	$ 620,900	$ 62,300	$ 459,650	$ 44,200	$161,250	$ 18,100
2	712,550	79,050	526,950	57,250	185,600	21,800
3	609,800	77,750	438,850	59,200	170,950	18,550
4	745,350	105,750	534,650	67,750	210,700	38,000
Total	$2,688,600	$324,850	$1,960,100	$228,400	$728,500	$ 96,450
1979-1 qtr.	$ 769,750	$ 88,300	$ 564,450	$ 69,000	$205,300	$ 19,300
2	869,050	109,150	648,100	87,650	220,950	21,500
3	802,800	97,050	611,350	78,500	191,450	18,550
4	1,023,700	116,750	781,600	89,400	242,100	27,350
Total	$3,465,300	$411,250	$2,605,500	$324,550	$859,800	$ 86,700
1980-1 qtr.	$1,030,450	$115,700	$ 794,650	$ 86,750	$235,800	$ 28,950
2	1,037,750	155,550	802,500	122,850	235,250	32,700
3	915,200	133,850	727,800	102,650	187,400	31,200
4	1,100,850	202,400	881,050	162,550	219,800	39,850
Total	$4,084,250	$607,500	$3,206,000	$474,800	$878,250	$132,700
1981-1 qtr.	$1,077,400	$210,800	$ 862,250	$155,600	$215,150	$ 55,200
2	1,131,150	236,350	917,950	185,450	213,200	50,900
3	1,006,000	127,950	820,350	99,950	185,650	28,000
4	1,162,100	143,850	951,900	111,050	210,200	32,800
Total	$4,376,650	$718,950	$3,552,450	$552,050	$824,200	$166,900
1982-1 qtr.	$1,041,550	$112,650	$ 861,300	$ 71,750	$180,250	$ 40,900
2	911,850	96,600	735,300	75,350	176,550	21,250
3	676,200	107,200	550,700	89,750	125,500	17,450
4	568,750	89,600	451,300	59,300	117,450	30,300
Total	$3,198,350	$406,050	$2,598,600	$296,150	$599,750	$109,900
1983-1 qtr.	$ 430,800	$ 56,650	$ 329,800	$ 40,800	$101,000	$ 15,850
2	411,350	58,300	308,200	49,300	103,150	9,000
3	314,150	42,900	220,150	32,200	94,000	10,700
4	473,750	57,150	341,450	49,600	132,300	7,550
Total	$1,630,050	$215,000	$1,199,600	$171,900	$430,450	$ 43,100
1984-1 qtr.	$ 408,950	$ 40,550	$ 273,000	$ 25,100	$135,950	$ 15,450
2	521,600	50,700	373,550	28,250	148,050	22,450
3	527,000	41,850	377,250	24,300	149,750	17,550
4	635,050	60,150	460,050	45,000	175,000	15,150
Total	$2,092,600	$193,250	$1,483,850	$122,650	$608,750	$ 70,600

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1956-1962
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1956-1 qtr.	$ 353,700	$ 39,050	$ 265,200	$ 33,200	$ 88,500	$ 5,850
2	291,700	26,300	222,550	20,300	69,150	6,000
3	284,150	34,800	215,400	27,150	68,750	7,650
4	242,700	26,450	179,050	20,650	63,650	5,800
Total	$ 1,172,250	$ 126,600	$ 882,200	$ 101,300	$ 290,050	$ 25,300
1957-1 qtr.	$ 221,300	$ 25,500	$ 168,850	$ 22,950	$ 52,450	$ 2,550
2	176,600	16,300	131,650	12,900	44,950	3,400
3	152,450	17,300	123,450	13,700	29,000	3,600
4	95,150	19,150	68,000	11,650	27,150	7,500
Total	$ 645,500	$ 78,250	$ 491,950	$ 61,200	$ 153,550	$ 17,050
1958-1 qtr.	$ 86,000	$ 17,600	$ 61,750	$ 14,400	$ 24,250	$ 3,200
2	78,300	22,650	57,050	15,150	21,250	7,500
3	79,800	15,950	55,450	8,700	24,350	7,250
4	107,200	21,250	73,700	13,300	33,500	7,950
Total	$ 351,300	$ 77,450	$ 247,950	$ 51,550	$ 103,350	$ 25,900
1959-1 qtr.	$ 139,100	$ 18,300	$ 97,900	$ 14,150	$ 41,200	$ 4,150
2	172,700	16,800	127,550	12,800	45,150	4,000
3	168,300	28,500	132,350	17,450	35,950	11,050
4	164,350	42,200	113,150	26,450	51,200	15,750
Total	$ 644,450	$ 105,800	$ 470,950	$ 70,850	$ 173,500	$ 34,950
1960-1 qtr.	$ 158,500	$ 44,750	$ 112,850	$ 35,700	$ 45,650	$ 9,050
2	124,250	55,900	85,600	39,100	38,650	16,800
3	114,950	56,550	90,200	41,150	24,750	15,400
4	129,950	60,100	86,350	44,350	43,600	15,750
Total	$ 527,650	$ 217,300	$ 375,000	$ 160,300	$ 152,650	$ 57,000
1961-1 qtr.	$ 140,550	$ 57,000	$ 95,150	$ 43,250	$ 45,400	$ 13,750
2	124,150	53,000	100,050	43,750	24,100	9,250
3	128,100	70,250	97,450	59,050	30,650	11,200
4	143,950	57,550	108,500	44,600	35,450	12,950
Total	$ 536,750	$ 237,800	$ 401,150	$ 190,650	$ 135,600	$ 47,150
1962-1 qtr.	$ 156,600	$ 42,300	$ 102,200	$ 26,200	$ 54,400	$ 16,100
2	167,400	45,300	123,850	30,850	43,550	14,450
3	147,950	36,400	108,850	23,550	39,100	12,850
4	190,100	30,550	133,950	22,650	56,150	7,900
Total	$ 662,050	$ 154,550	$ 468,850	$ 103,250	$ 193,200	$ 51,300

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1963-1969
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1963-1 qtr.	$ 196,150	$ 39,000	$ 140,250	$ 31,100	$ 55,900	$ 7,900
2	197,300	62,150	148,300	49,450	49,000	12,700
3	208,750	45,700	140,350	33,850	68,400	11,850
4	267,450	45,100	177,950	38,500	89,500	6,600
Total	$ 869,650	$ 191,950	$ 606,850	$ 152,900	$ 262,800	$ 39,050
1964-1 qtr.	$ 312,150	$ 64,000	$ 194,200	$ 52,900	$ 117,950	$ 11,100
2	428,100	63,200	248,150	46,300	179,950	16,900
3	293,750	52,850	209,900	40,700	83,850	12,150
4	314,050	50,800	209,000	38,000	105,050	12,800
Total	$ 1,348,050	$ 230,850	$ 861,250	$ 177,900	$ 486,800	$ 52,950
1965-1 qtr.	$ 338,850	$ 43,150	$ 253,000	$ 35,500	$ 85,850	$ 7,650
2	365,650	33,400	255,400	26,050	110,250	7,350
3	385,050	42,800	284,500	37,250	100,550	5,550
4	443,400	41,100	329,750	30,250	113,650	10,850
Total	$ 1,532,950	$ 160,450	$ 1,122,650	$ 129,050	$ 410,300	$ 31,400
1966-i qtr.	$ 514,200	$ 57,450	$ 398,150	$ 46,450	$ 116,050	$ 11,000
2	497,800	54,350	384,400	38,500	113,400	15,850
3	457,650	38,100	364,950	30,550	92,700	7,550
4	414,800	41,300	335,600	31,300	79,200	10,000
Total	$ 1,884,450	$ 191,200	$ 1,483,100	$ 146,800	$ 401,350	$ 44,400
1967-1 qtr.	$ 327,800	$ 37,150	$ 268,600	$ 32,350	$ 59,200	$ 4,800
2	335,600	42,500	273,550	29,100	62,050	13,400
3	319,200	35,350	262,950	25,350	56,250	10,000
4	290,200	33,800	219,550	23,500	70,650	10,300
Total	$ 1,272,800	$ 148,800	$ 1,024,650	$ 110,300	$ 248,150	$ 38,500
1968-1 qtr.	$ 287,050	$ 36,800	$ 223,700	$ 31,750	$ 63,350	$ 5,050
2	307,300	44,850	246,400	34,750	60,900	10,100
3	303,800	31,900	232,200	24,250	71,600	7,650
4	422,300	40,100	257,600	28,700	164,700	11,400
Total	$ 1,320,450	$ 153,650	$ 959,900	$ 119,450	$ 360,550	$ 34,200
1969-1 qtr.	$ 376,550	$ 51,450	$ 260,000	$ 40,250	$ 116,550	$ 11,200
2	557,850	46,000	372,550	35,700	185,300	10,300
3	279,300	63,700	184,950	51,100	94,350	12,600
4	303,300	50,600	215,150	35,600	88,150	15,000
Total	$ 1,517,000	$ 211,750	$ 1,032,650	$ 162,650	$ 484,350	$ 49,100

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1970-1976
(Thousands of Dollars)

	TOTAL		Metal Cutting		Metal Forming	
Period	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1970-1 qtr.	$ 256,650	$ 48,750	$ 191,300	$ 39,750	$ 65,350	$ 9,000
2	185,550	46,100	131,950	41,850	53,600	4,250
3	150,400	41,750	106,900	34,150	43,500	7,600
4	140,750	42,600	76,600	28,800	64,150	13,800
Total	$ 733,350	$ 179,200	$ 506,750	$ 144,550	$ 226,600	$ 34,650
1971-1 qtr.	$ 151,000	$ 30,550	$ 95,500	$ 23,250	$ 55,500	$ 7,300
2	182,250	30,150	128,800	24,550	53,450	5,600
3	204,100	27,450	144,500	20,900	59,600	6,550
4	209,950	25,700	155,300	15,950	54,650	9,750
Total	$ 747,300	$ 113,850	$ 524,100	$ 84,650	$ 223,200	$ 29,200
1972-1 qtr.	$ 242,050	$ 33,550	$ 180,550	$ 27,100	$ 61,500	$ 6,450
2	284,750	34,900	193,800	28,350	90,950	6,550
3	301,550	51,550	210,900	42,800	90,650	8,750
4	417,100	46,550	292,000	33,450	125,100	13,100
Total	$ 1,245,450	$ 166,550	$ 877,250	$ 131,700	$ 368,200	$ 34,850
1973-1 qtr.	$ 558,150	$ 73,850	$ 370,150	$ 55,850	$ 188,000	$ 18,000
2	610,550	67,550	395,450	52,550	215,100	15,000
3	512,850	87,250	358,450	68,900	154,400	18,350
4	586,050	116,400	426,350	97,750	159,700	18,650
Total	$ 2,267,600	$ 345,050	$ 1,550,400	$ 275,050	$ 717,200	$ 70,000
1974-1 qtr.	$ 644,500	$ 107,700	$ 509,750	$ 88,100	$ 134,750	$ 19,600
2	737,950	109,900	592,550	83,650	145,400	26,250
3	536,300	95,200	394,100	70,900	142,200	24,300
4	266,500	85,000	219,250	58,750	47,250	26,250
Total	$ 2,185,250	$ 397,800	$ 1,715,650	$ 301,400	$ 469,600	$ 96,400
1975-1 qtr.	$ 188,350	$ 49,250	$ 147,700	$ 28,550	$ 40,650	$ 20,700
2	276,800	68,950	201,050	39,800	75,750	29,150
3	293,750	46,700	209,600	31,750	84,150	14,950
4	305,150	47,800	222,150	35,300	83,000	12,500
Total	$ 1,064,050	$ 212,700	$ 780,500	$ 135,400	$ 283,550	$ 77,300
1976-1 qtr.	$ 354,500	$ 58,800	$ 259,950	$ 45,800	$ 94,550	$ 13,000
2	452,700	43,900	322,700	31,350	130,000	12,550
3	527,800	69,500	383,500	55,900	144,300	13,600
4	626,450	69,550	510,450	52,500	116,000	17,050
Total	$ 1,961,450	$ 241,750	$ 1,476,600	$ 185,550	$ 484,850	$ 56,200

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

NET NEW ORDERS FOR MACHINE TOOLS
Quarterly and Yearly, 1977 to Date
(Thousands of Dollars)

Period	TOTAL		Metal Cutting		Metal Forming	
	Domestic	Foreign	Domestic	Foreign	Domestic	Foreign
1977-1 qtr.	$ 603,900	$ 63,550	$ 443,850	$ 45,150	$160,050	$ 18,400
2	692,250	78,300	522,600	61,100	169,650	17,200
3	650,700	75,150	435,300	60,900	215,400	14,250
4	762,800	68,700	578,950	54,200	183,850	14,500
Total	$2,709,650	$285,700	$1,980,700	$221,350	$728,950	$ 64,350
1978-1 qtr.	$ 847,300	$ 92,750	$ 646,250	$ 77,600	$201,050	$ 15,150
2	1,013,250	116,700	789,550	97,000	223,700	19,700
3	953,850	73,800	720,700	56,250	233,150	17,550
4	1,129,700	121,150	886,650	101,450	243,050	19,700
Total	$3,944,100	$404,400	$3,043,150	$332,300	$900,950	$ 72,100
1979-1 qtr.	$1,322,800	$148,600	$1,031,550	$126,700	$291,250	$ 21,900
2	1,189,000	167,450	963,300	120,250	225,700	47,200
3	1,171,850	181,350	969,400	151,100	202,450	30,250
4	1,172,850	267,550	901,550	231,250	271,300	36,300
Total	$4,856,500	$764,950	$3,865,800	$629,300	$990,700	$135,650
1980-1 qtr.	$1,331,950	$185,500	$1,057,900	$149,900	$274,050	$ 35,600
2	1,210,050	125,300	1,054,300	87,800	155,750	37,500
3	825,350	92,150	659,050	69,250	166,300	22,900
4	872,200	111,800	724,250	82,300	147,950	29,500
Total	$4,229,550	$514,750	$3,495,500	$389,250	$744,050	$125,500
1981-1 qtr.	$ 809,950	$110,400	$ 615,250	$ 91,350	$194,700	$ 19,050
2	723,600	143,400	559,950	101,250	163,650	42,150
3	530,650	62,800	408,100	47,150	122,550	15,650
4	498,450	65,600	362,500	42,550	135,950	23,050
Total	$2,562,650	$382,200	$1,945,800	$282,300	$616,850	$ 99,900
1982-1 qtr.	$ 432,300	$ 74,500	$ 328,400	$ 56,450	$103,900	$ 18,050
2	303,050	79,600	216,450	58,300	86,600	21,300
3	237,300	42,650	154,000	29,450	83,300	13,200
4	288,700	39,650	190,750	30,650	97,950	9,000
Total	$1,261,350	$236,400	$ 889,600	$174,850	$371,750	$ 61,550
1983-1 qtr.	$ 285,550	$ 29,300	$ 205,850	$ 18,250	$ 79,700	$ 11,050
2	366,700	32,400	250,300	19,000	116,400	13,400
3	439,450	28,700	305,900	16,300	133,550	12,400
4	466,500	47,550	307,400	28,650	159,100	18,900
Total	$1,558,200	$137,950	$1,069,450	$ 82,200	$488,750	$ 55,750
1984-1 qtr.	$ 551,900	$ 48,550	$ 376,100	$ 36,650	$175,800	$ 11,900
2	654,650	109,750	410,750	88,450	243,900	21,300
3	734,950	65,250	439,150	53,850	295,800	11,400
4	689,550	61,200	473,550	37,300	216,000	23,900
Total	$2,631,050	$284,750	$1,699,550	$216,250	$931,500	$ 68,500

Source: NMTBA, "Industry Estimate of Machine Tool New Orders, Cancellations, Shipments and Backlog" (monthly).

SHIPMENTS OF MACHINE TOOL PRODUCTS
By Type of Machine, 1975 to Date
(Millions of Dollars)

	1975	1976	1977	1978	1979	1980	1981	1982(r)
METAL CUTTING TOTAL	$2,405.7	$2,146.4	$2,560.5	$3,377.1	$4,127.5	$4,952.3	$5,554.0	$4,154.7
Boring Machines	90.6	80.2	93.5	133.0	169.9	200.0	227.0	198.7
Drilling Machine	97.9	(99.0)	108.9	(155.0)	167.1	188.8	155.0	67.3
Gear Cutting & Finishing Machines	71.7	61.9	67.1	111.5	104.6	124.7	132.5	87.3
Grinding & Polishing Machines (a)	276.2	243.5	288.3	359.5	464.5	553.8	623.3	515.3
Lathes	474.0	449.8	455.9	554.9	675.7	823.0	865.3	523.6
Milling Machines	141.9	146.8	167.8	204.8	259.3	(322.0)	390.4	264.5
Other Machine Tools (b)	802.3	629.8	713.6	994.8	1,279.3	1,620.8	1,838.3	1,437.4
Parts (c)	382.8	400.7	502.1	606.0	813.7	877.3	1,038.2	891.9
Not Specified by Kind	(68.4)	(34.7)	63.3	(s)	(193.3)	(241.8)	(284.0)	168.7
METAL FORMING TOTAL	1,026.1	1,051.0	1,114.7	1,357.9	1,634.8	1,749.2	1,652.1	1,383.9
Punching, Shearing, Bending & Forming	242.3	271.3	280.1	320.4	389.9	429.0	444.1	317.3
Presses (d)	282.8	268.1	282.6	369.1	449.5	498.5	422.7	369.2
Other (b,d)	162.3	157.0	171.7	220.3	264.4	238.9	221.4	217.0
Parts (c)	322.8	344.3	295.5	400.5	482.5	530.8	498.4	380.0
Not Specified by Kind	(15.9)	(10.2)	84.8	(s)	48.5	52.0	65.5	100.5

r - revised

(a) Excluding Gear-Tooth Grinding, Honing, Lapping, Polishing and Buffing Machines; for 1977–82 honing and lapping machines are included.

(b) Including those designed primarily for Home Workshops, Laboratories, etc.

(c) Data represents parts sold separately and rebuilt machine tools.

(d) 1975–78 Forging Presses are included in "Presses;" 1979 to date Forging Presses are included in "Other."

(s) Withheld because estimate did not meet publication standards.

( ) Indicates standard errors exceeding 15%.

This table includes machine tool products only—those produced as "primary" products of the machine tool industry and as "secondary" products by other industries.

Sources: U.S. Bureau of the Census; "Census of Manufactures, Metal Working Machinery and Equipment" and "Annual Survey of Manufactures."

SHIPMENTS OF MACHINE TOOLS
Metal Cutting and Metal Forming, Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 671,907	NA	NA	NA	NA
1959	196,701	679,538	65,892	$648,366	130,809	$ 31,170
1960	183,142	777,692	62,225	749,900	120,917	27,792
1961	170,982	764,453	57,503	737,051	113,479	27,402
1962	190,288	867,269	67,678	837,370	122,610	29,899
1963	198,571	967,133	73,255	934,485	125,316	32,648
1964	212,257	1,209,076	81,020	1,176,645	131,237	32,431
1965	250,492	1,457,685	93,350	1,418,294	157,142	39,391
1966	321,705	1,712,849	112,654	1,658,651	209,051	54,198
1967	311,472	1,869,298	117,651	1,820,197	193,821	49,101
1968	301,114	1,722,727	95,927	1,668,852	205,187	53,875
1969	308,273	1,692,188	92,148	1,631,239	216,125	60,949
1970	252,431	1,551,777	73,517	1,501,454	178,914	50,323
1971	211,432	1,057,870	51,843	1,009,389	159,589	48,481
1972	267,065	1,269,302	71,655	1,220,521	195,410	48,781
1973	307,680	1,787,850	94,833	1,724,719	212,847	63,131
1974	337,799	2,165,937	106,016	2,096,198	231,783	69,739
1975	280,341	2,406,082	92,731	2,353,936	187,610	52,146
1976	270,875	2,178,265	82,937	2,119,846	187,938	58,419
1977	284,583	2,453,423	92,270	2,393,964	192,313	59,459
1978	327,460	3,142,594	87,589	3,050,209	239,871	92,385
1979	345,218	4,064,045	89,586E	3,934,566E	255,632E	29,479E
1980	323,899	4,812,349	88,428E	4,674,068E	235,471E	38,281E
1981	301,313	5,111,253	87,981E	5,007,848E	213,332E	103,405E
1982(r)	178,638	3,804,250	53,141E	3,738,397E	125,497E	65,853E
1983(r)	150,837	2,044,849	43,199E	1,986,212E	107,638E	58,637E
1984(p)	162,154	2,412,504	49,239E	2,347,847E	112,915E	64,657E

p - Preliminary. r - Revised. NA - Not Available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

Data on shipments of complete machine tools published in the "Current Industrial Reports" series of the Census tend to vary slightly from those published by NMTBA. There are several reasons for the difference; among them is the fact that NMTBA reports are extended to a 100 percent estimate based on earlier coverage by the "Current Industrial Reports" series. Refer to this chapter's introduction for a detailed explanation of the various sources of statistics for machine tools.

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

	Total Shipments		Machines Value at $1,000 or More		Machines Valued at Less Than $1,000	
Year	Units	Value	Units	Value	Units	Value
1958	NA	$ 462,934	NA	NA	NA	NA
1959	143,380	468,777	45,212	$ 447,009	98,168	$ 21,768
1960	133,511	539,340	42,914	520,294	90,597	19,046
1961	124,260	531,343	40,363	512,424	83,897	18,919
1962	138,855	626,833	47,942	606,297	90,913	20,536
1963	139,896	657,607	50,353	635,157	89,543	22,450
1964	153,831	874,467	58,714	852,392	95,117	22,075
1965	184,168	1,047,823	68,005	1,021,331	116,163	26,492
1966	242,698	1,231,907	80,673	1,194,149	162,025	37,758
1967	236,167	1,373,178	86,014	1,336,419	150,153	36,759
1968	225,778	1,309,361	70,505	1,271,876	155,273	37,485
1969	229,974	1,242,550	65,199	1,198,504	164,775	44,046
1970	188,491	1,097,718	49,314	1,061,066	139,177	36,652
1971	157,099	714,454	32,443	677,841	124,656	36,613
1972	207,290	857,964	47,846	821,899	159,444	36,065
1973	252,237	1,224,715	63,685	1,175,058	188,552	49,657
1974	272,811	1,525,575	69,060	1,466,671	203,751	58,904
1975	229,169	1,790,360	65,883	1,750,797	163,286	39,563
1976	212,757	1,592,216	54,974	1,546,631	157,783	45,585
1977	220,017	1,791,293	59,500	1,743,724	160,517	47,569
1978	257,647	2,334,425	58,116	2,265,541	199,531	68,884
1979	263,019	3,037,205	59,453E	2,943,225E	203,566E	93,980E
1980	248,563	3,716,370	62,185E	3,612,645E	186,378E	103,725E
1981	234,647	4,046,940	66,076E	3,978,970E	168,571E	67,970E
1982(r)	130,434	2,940,626	35,060E	2,899,429E	95,374E	41,197E
1983(r)	100,764	1,464,204	27,088E	1,432,210E	73,676E	31,994E
1984(p)	105,833	1,722,226	31,574E	1,687,393E	74,259E	34,833E

p - Preliminary. r - Revised. NA - Not Available. E - Estimate by NMTBA.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

Average Value Over & Under $1,000, 1958 to 1977, Over and Under $2,500, 1978 to Date

(Values in Thousands of Dollars)

Year	Total Shipments		Machines Valued at $1,000 or More		Machines Valued at Less Than $1,000	
	Units	Value	Units	Value	Units	Value
1958	NA	$ 203,973	NA	NA	NA	NA
1959	53,321	210,761	20,680	$ 201,359	32,641	$ 9,402
1960	49,631	238,352	19,311	229,606	30,320	8,746
1961	46,722	233,110	17,140	224,627	29,582	8,483
1962	51,433	240,436	19,736	231,073	31,697	9,363
1963	58,675	309,526	22,902	299,328	35,773	10,198
1964	58,426	334,609	22,306	324,253	36,120	10,356
1965	66,324	409,862	25,345	396,963	40,979	12,899
1966	79,007	480,942	31,981	464,502	47,026	16,440
1967	75,305	496,120	31,637	483,778	43,668	12,342
1968	75,336	413,366	25,422	396,976	49,914	16,390
1969	78,299	449,638	26,949	432,735	51,350	16,903
1970	63,940	454,059	24,203	440,388	39,737	13,671
1971	54,333	343,416	19,400	331,548	34,933	11,868
1972	59,775	411,338	24,107	398,622	35,668	12,716
1973	55,443	563,135	31,148	549,661	24,295	13,474
1974	64,988	640,362	36,956	629,527	28,032	10,835
1975	51,172	615,722	26,848	603,139	24,324	12,583
1976	58,118	586,049	27,963	573,215	30,155	12,834
1977	64,566	662,130	32,770	650,240	31,796	11,890
1978	69,813	808,169	29,473	784,668	40,340	23,501
1979	82,199	1,026,840	30,133	991,341	52,066	35,499
1980	75,336	1,095,979	26,243	1,061,423	49,093	34,556
1981	66,666	1,064,313	21,905	1,028,878	44,761	35,435
1982(r)	48,204	863,624	18,081	838,968	30,123	24,656
1983(r)	50,073	580,645	16,111	554,002	33,962	26,643
1984(p)	56,321	690,278	17,665	660,454	38,656	29,824

p - Preliminary. r - Revised. NA - Not Available.

Source: U.S. Dept. of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly & Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS
By Class of Product, 1954 to Date
(Millions of Dollars)

Year	TOTAL	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting and Finishing	35414 Grinding and Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting Machines
1954	$ 879.0	$114.4	$ 86.1	$ 48.1	$154.3	$206.9	$122.5	$ 146.7
1955	665.8	77.4	53.8	36.6	123.9	153.3	89.6	131.2
1956	891.8	101.8	65.4	49.4	172.8	217.1	115.8	169.5
1957	878.3	102.0	56.3	38.9	160.1	199.8	155.0	166.2
1958	463.0	51.6	30.0	22.7	89.4	98.7	89.3	81.3
1959	468.8	46.2	33.4	24.7	93.8	119.5	73.3	77.9
1960	539.3	46.9	38.9	34.3	117.0	135.4	79.4	87.4
1961	531.3	51.5	36.8	36.4	121.0	126.5	73.7	85.4
1962	626.8	61.4	53.2	35.8	127.9	152.3	95.8	100.4
1963	657.6	67.9	52.0	39.5	136.8	154.8	106.1	100.5
1964	874.5	74.1	72.3	47.1	175.9	198.1	125.8	181.2
1965	1,047.8	91.9	83.2	55.7	213.6	234.8	144.0	224.7
1966	1,231.9	110.9	105.9	59.0	235.9	286.5	201.7	232.0
1967	1,373.2	117.8	122.8	63.9	247.8	334.0	234.3	252.6
1968	1,309.4	93.7	67.7	68.2	235.1	316.2	234.1	294.4
1969	1,242.6	80.2	67.5	65.6	227.3	288.9	184.6	328.5
1970	1,097.7	62.1	70.9	66.3	219.4	240.1	110.0	329.0
1971	714.5	35.8	43.4	50.1	142.9	174.9	54.4	212.7
1972	858.0	54.1	65.8	50.3	151.0	203.2	81.7	251.9
1973	1,224.7	66.7	90.5	55.4	209.6	299.0	104.6	398.9
1974	1,525.6	81.4	77.9	65.2	249.9	370.2	137.7	542.3
1975	1,790.4	83.9	92.9	65.1	273.2	464.2	134.0	677.1
1976	1,592.2	77.8	100.4	56.0	246.8	430.3	134.4	546.6
1977	1,791.3	84.9	107.2	61.4	273.1	436.3	160.2	668.1
1978	2,334.4	117.7	152.4	102.7	348.6	535.9	194.3	882.9
1979	3,037.2	177.4	150.5	111.2	474.9	650.3	279.8	1,193.1
1980	3,716.4	192.0	166.9	130.3	555.8	827.0	339.3	1,505.2
1981	4,046.9	231.0	140.0	133.1	615.4	816.8	436.6	1,674.2
1982(r)	2,940.6	193.8	65.9	86.5	486.7	507.3	265.6	1,334.9
1983(r)	1,464.2	95.8	41.1	35.8	280.8	320.9	146.5	543.4
1984(p)	1,722.2	104.2	35.6	42.4	334.9	310.3	179.9	714.8

p - Preliminary.   r - Revised.

Note: Other Metal Cutting Machines include machining centers, transfer machines, shapers, sawing and cutoff machines, and other metal cutting machines not classified elsewhere. For a breakdown by type, refer to pages detailing shipments of these machines also appearing in this chapter.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ 35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL CUTTING MACHINE TOOLS

By Class of Product, 1954 to Date

(Percentage of Dollar Value)

Year	35411 Boring Machines	35412 Drilling Machines	35413 Gear Cutting & Finishing	35414 Grinding & Polishing	35415 Lathes	35416 Milling Machines	35417 Other Metal Cutting
1954	13.0%	9.8%	5.5%	17.6%	23.5%	13.9%	16.7%
1955	11.6	8.1	5.5	18.6	23.0	13.5	19.7
1956	11.4	7.3	5.5	19.4	24.3	13.0	19.0
1957	11.6	6.4	4.4	18.2	22.7	17.6	18.9
1958	11.1	6.5	4.9	19.3	21.3	19.3	17.6
1959	9.9	7.1	5.3	20.0	25.5	15.6	16.6
1960	8.7	7.2	6.4	21.7	25.1	14.7	16.2
1961	9.7	6.9	6.9	22.8	23.8	13.9	16.1
1962	9.8	8.5	5.7	20.4	24.3	15.3	16.0
1963	10.3	7.9	6.0	20.8	23.5	16.1	15.3
1964	8.5	8.3	5.4	20.1	22.7	14.4	20.7
1965	8.8	7.9	5.3	20.4	22.4	13.7	21.4
1966	9.0	8.6	4.8	19.1	23.3	16.4	18.8
1967	8.6	8.9	4.7	18.0	24.3	17.1	18.4
1968	7.2	5.2	5.2	18.0	24.1	17.9	22.5
1969	6.5	5.4	5.3	18.3	23.2	14.9	26.4
1970	5.7	6.5	6.0	20.0	21.9	10.0	30.0
1971	5.0	6.1	7.0	20.0	24.5	7.6	29.8
1972	6.3	7.7	5.9	17.6	23.7	9.5	29.4
1973	5.4	7.4	4.5	17.1	24.4	8.5	32.6
1974	5.3	5.1	4.3	16.4	24.3	9.0	35.6
1975	4.7	5.2	3.6	15.3	25.9	7.5	37.8
1976	4.9	6.3	3.5	15.5	27.0	8.4	34.3
1977	4.7	6.0	3.4	15.2	24.4	8.9	37.3
1978	5.0	6.5	4.4	14.9	23.0	8.3	37.9
1979	5.8	5.0	3.7	15.6	21.4	9.2	39.3
1980	5.2	4.5	3.5	15.0	22.3	9.1	40.5
1981	5.7	3.5	3.3	15.2	20.2	10.8	41.4
1982(r)	6.6	2.2	2.9	16.6	17.3	9.0	45.4
1983(r)	6.5	2.8	2.4	19.2	21.9	10.0	37.1
1984(p)	6.1	2.1	2.5	19.4	18.0	10.4	41.5

p - Preliminary. r - Revised.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Report, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1954 to Date
(Millions of Dollars)

Year	TOTAL (a)	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35485 (In Part) Other (a)
1954	$ 350.2	$216.4	$24.4	$ 26.3	$ 35.6	$ 47.5
1955	295.4	170.8	15.6	28.9	35.8	44.3
1956	384.1	240.1	15.5	34.9	48.8	44.8
1957	403.2	238.7	24.7	38.3	43.9	57.6
1958	209.0	76.5	17.4	32.0	32.1	51.0
1959	210.8	84.6	17.9	29.9	35.7	42.7
1960	238.4	105.0	21.0	32.9	34.3	45.2
1961	233.1	111.3	15.8	33.3	32.5	40.2
1962	240.4	109.5	23.7	34.5	29.0	43.7
1963	309.5	136.0	22.3	42.8	45.2	63.2
1964	334.6	169.5	23.1	33.2	42.7	66.1
1965	409.9	209.2	32.8	43.9	49.4	74.6
1966	480.9	253.3	32.7	49.7	51.0	94.2
1967	496.1	240.1	29.6	56.9	57.4	112.1
1968	413.4	199.1	31.9	57.1	64.4	60.9
1969	449.6	223.7	32.0	53.6	66.0	74.3
1970	454.1	239.6	36.6	47.7	59.8	70.4
1971	343.4	166.5	37.0	41.4	53.3	45.2
1972	411.3	166.7	34.5	62.5	67.9	79.8
1973	563.1	242.7	38.7	75.8	94.5	111.4
1974	640.4	307.0	40.1	86.1	113.0	94.2
1975	615.7	269.4	39.5	121.0	115.4	70.4
1976	586.0	223.6	52.2	120.0	118.8	71.4
1977	662.1	260.7	55.1	130.6	137.2	78.5
1978	808.2	350.9	59.3	146.6	147.7	103.7
1979	1,026.8	434.0	84.7	181.2	183.4	143.5
1980	1,096.0	440.8	73.8	204.2	214.9	162.3
1981	1,064.3	429.6	79.0	206.1	212.8	136.8
1982(r)	863.6	344.8	79.0	142.2	166.5	131.1
1983(r)	580.6	160.8	48.0	120.1	138.6	113.1
1984(p)	690.3	205.1	29.0	139.8	166.5	149.9

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS

By Type of Machine, 1954 to Date

(Percentage of Dollar Value)

Year	35422 Presses, Including Forging (b)	35423 (In Part) Forging Machines, Excluding Presses (c)	35421 (In Part) Punching and Shearing Machines	35421 (In Part) Bending and Forming Machines	35423 (In Part) 35435 (In Part) Other (a)
1954	61.8%	7.0%	7.5%	10.2%	13.5%
1955	57.8	5.3	9.8	12.1	15.0
1956	62.5	4.0	9.1	12.7	11.7
1957	59.2	6.1	9.5	10.9	14.3
1958	36.6	8.3	15.3	15.4	24.4
1959	40.1	8.5	14.2	16.9	20.3
1960	44.0	8.8	13.8	14.4	19.0
1961	47.7	6.8	14.3	13.9	17.3
1962	45.5	9.9	14.3	12.1	18.2
1963	44.0	7.2	13.8	14.6	20.4
1964	50.7	6.9	9.9	12.8	19.7
1965	51.0	8.0	10.7	12.1	18.2
1966	52.7	6.8	10.3	10.6	19.6
1967	48.4	5.9	11.5	11.6	22.6
1968	48.2	7.7	13.8	15.6	14.7
1969	49.8	7.1	11.9	14.7	16.5
1970	52.7	8.1	10.5	13.2	15.5
1971	48.5	10.8	12.0	15.5	13.2
1972	40.5	8.4	15.2	16.5	19.4
1973	43.1	6.9	13.4	16.8	19.8
1974	47.9	6.3	13.4	17.7	14.7
1975	43.8	6.4	19.7	18.7	11.4
1976	38.2	8.9	20.5	20.3	12.2
1977	39.4	8.3	19.7	20.7	11.9
1978	43.4	7.3	18.1	18.3	12.9
1979	42.3	8.2	17.6	17.9	14.0
1980	40.2	6.7	18.6	19.6	14.8
1981	40.4	7.4	19.4	20.0	12.9
1982(r)	39.9	9.1	16.5	19.3	15.2
1983(r)	27.7	8.3	20.7	23.9	19.5
1984(p)	29.7	4.2	20.3	24.1	21.7

p - Preliminary. r - Revised.

(a) Includes some metalworking machinery which are not machine tools for 1959 through 1967. These metalworking machines are excluded after 1967.

(b) Excludes forging presses from 1979 to date.

(c) Includes forging presses from 1979 to date.

Individual percentages may not add to 100% due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls		Year	SHIPMENTS of Machines and Controls	
		Units	Value		Units	Value
TOTAL						
	1970(a)	1,901	$ 209.0	1982(r,g)	6,066	$1,126.6
	1971(a)	1,236	153.2	1983(r,g)	4,781	677.1
	1972(a)	1,630	170.1	1984(p,g)	5,811	767.3
	1973(a)	2,865	272.1			
	1974(a)	4,210	378.7			
	1975(a)	4,136	504.7			
	1976(a)	3,856	501.0			
	1977(a)	4,482	496.7			
	1978(a)	5,688	649.2			
	1979(g)	7,925	1,014.6			
	1980(g)	9,984	1,371.7			
	1981(g)	8,945	1,467.3			
Boring Machines						
	1970	175	29.5	1982	231	110.7
	1971	92	18.4	1983	69	37.1
	1972	84	21.0	1984(p)	119	45.1
	1973	128	26.8			
	1974	146	33.7			
	1975	153	39.4			
	1976	120	35.6			
	1977	101	33.0			
	1978	127	47.3			
	1979	186	69.5			
	1980	226	92.5			
	1981	293	120.2			
Drilling Machines (h)						
	1970	215	13.0	1982(r)	0	0
	1971	138	11.3	1983(r)	0	0
	1972	118	8.4	1984(p)	0	0
	1973	326	19.0			
	1974	216	11.7			
	1975	100	11.0			
	1976	197	13.2			
	1977	288	20.0			
	1978	321	22.0			
	1979	237	17.7			
	1980	384	33.4			
	1981	455	52.8			
Lathes						
	1970	507	55.3	1982	1,489	333.4
	1971	428	50.4	1983(r)	1,202	224.6
	1972	570	67.1	1984(p)	1,524	212.5
	1973	1,031(c)	95.2(c)			
	1974	1,381	137.3			
	1975	1,640	212.7			
	1976	1,321	205.9			
	1977	1,178	195.3			
	1978	1,464	237.2			
	1979	2,362	347.7			
	1980	2,739	481.2			
	1981	2,021	441.4			

(Continued)

SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS

By Type of Machine, 1970 to Date

(Values in Millions of Dollars)

Type of Machine	Year	SHIPMENTS of Machines and Controls Units	SHIPMENTS of Machines and Controls Value	Year	SHIPMENTS of Machines and Controls Units	SHIPMENTS of Machines and Controls Value
Milling Machines (d)						
	1970	150	$ 23.4	1982(r)	1,061	$185.6
	1971	105	12.6	1983(r)	1,091	108.9
	1972	229	15.8	1984(p)	1,434	108.9
	1973	240	16.1			
	1979	2,045	93.8			
	1980	2,600	162.7			
	1981	1,763	190.6			
Machining Centers						
	1970	651	68.9	1982(r)	1,396(i)	357.6(i)
	1971	344	46.6	1983(r)	1,005(i)	182.9(i)
	1972	475	45.3	1984(p)	1,237(i)	213.2(i)
	1973	1,162	115.1			
	1974	1,692	163.1			
	1975	1,460	196.8			
	1976	1,225	178.4			
	1977	1,201	175.0			
	1978	1,486	246.0			
	1979	1,953	356.5			
	1980	2,132	413.0			
	1981	2,081	482.7			
Grinding and Polishing Machines						
	1979	206	28.6	1982(r)	590	49.6
	1980	271	32.9	1983(r)	494	42.7
	1981	645	46.7	1984(p)	546	65.9
All Other Metal Cutting and Metal Forming Type Machine Tools						
	1970	203	19.0	1982(r)	1,299(g)	89.6(g)
	1971	131	13.9	1983(r)	920(g)	80.9(g)
	1972	154	12.6	1984(p)	951(g)	121.7(g)
	1973	17(a,e)	5.0(a,e)			
	1974	775(a,f)	32.8(a,f)			
	1975	783(a,f)	44.8(a,f)			
	1976	993(a,f)	67.9(a,f)			
	1977	1,714(a,f)	73.4(a,f)			
	1978	2,290(a,f)	96.7(a,f)			
	1979	936(g)	100.7(a,f)			
	1980	1,632(g)	156.0(g)			
	1981	1,667(g)	133.0(g)			

p - Preliminary. r - Revised.

(a) No metal forming NC data are included.
(b) Beginning with 1973, data no longer published.
(c) Includes data for grinding and polishing machines.
(d) For 1974-1978 data were included in the "All Other" category.
(e) For 1973 only, grinding and polishing machines are reported with lathes and are not included in the "All Other" category.
(f) Includes milling machines and grinding and polishing machines.
(g) Includes data for punching, shearing, bending, and forming machines; all other metal forming NC data withheld to avoid disclosure.
(h) The data for 1982 and 1983 should have been reported in "Machining Centers." It is possible that the data for for 1970 through 1981 was misclassified and overstated.
(i) The data for 1982 and 1983 reflect the addition of misclassified data, originally reported in "Drilling Machines."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

NUMERICALLY CONTROLLED AND AUTOMATIC METALWORKING MACHINERY
By Type of Control
Total Shipments and Unfilled Orders, 1964 to 1972 (a)

	SHIPMENTS			UNFILLED ORDERS December 31		
	Number of Machines	Millions of Dollars		Number of Machines	Millions of Dollars	
		Machines & Controls	Controls Only		Machines & Controls	Controls Only
TOTAL						
1964	1,517	$ 105.5	$ 29.2	987	$ 113.7	$ 26.4
1965	2.100	159.3	43.9	1,964	211.3	57.1
1966	2,939	249.1	55.5	2,439	329.3	75.7
1967	2,957	284.9	69.4	2,054	337.9	72.1
1968	2,917	353.8	81.2	1,336	253.8	53.3
1969	2,376	293.9	70.2	1,148	172.3	36.9
1970	1,901	209.0	50.1	683	121.8	26.3
1971	1,238	153.2	36.0	581	107.7	23.3
1972	1,630	170.1	42.3	1,334	182.1	50.6
Point-to-Point Positioning						
1964	1,145	52.4	15.0	586	43.9	12.2
1965	1,604	89.0	25.9	1,278	93.5	25.6
1966	2,044	126.4	26.1	1,422	139.0	33.4
1967	2,050	143.0	36.1	1,033	100.3	24.0
1968	1,752	141.6	34.8	530	67.3	16.4
1969	1,324	110.2	27.6	507	54.7	12.8
1970	1,033	82.3	19.2	222	38.3	7.7
1971	476	50.4	11.2	146	30.3	6.2
1972	605	49.5	10.4	337	50.8	15.7
Continuous Path Activated by Tape or Punch Card						
1964	172	36.7	11.2	151	35.0	10.7
1965	229	43.7	13.8	383	86.1	25.7
1966	524	79.5	22.9	637	151.4	33.8
1967	621	113.2	27.3	782	211.4	41.4
1968	991	198.2	43.2	700	176.6	34.5
1969	899	171.0	39.8	577	108.6	22.7
1970	785	118.9	29.5	423	78.4	17.9
1971	711	97.6	23.8	425	76.6	16.9
1972	989	117.4	31.3	977	128.3	34.4
Dial or Plug Board Type of Prerecorded Motion Program Control						
1964	200	16.4	3.0	250	34.8	3.5
1965	267	26.6	4.2	303	31.7	5.8
1966	371	43.2	6.5	380	38.9	8.5
1967	286	28.7	6.0	239	26.2	6.7
1968	174	14.0	3.2	106	9.9	2.4
1969	153	12.7	2.8	64	9.0	1.4
1970	83	7.9	1.4	38	5.1	0.7
1971	51	5.2	0.9	10	0.8	0.2
1972	36	3.3	0.6	20	3.0	0.4

(a) The publication of this data was discontinued in 1973.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BORING MACHINES
Units and Value, 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
TOTAL	761	922	1,671	1,793	1,699	994	455	522
Horizontal Boring, Drilling & Milling Machines								
Table Type	81	104	97	102	115	77	29	27E
Floor Type	88	85	82	72	29			
Precision Boring Machines	509	648	868	771	661	564	370	450
Jig Boring Machines	83	85	624	848	894	353	56(a)	45E(a)
All Other Boring Machines	—							
VALUE (Millions of Dollars)								
TOTAL	$84.9	$117.7	$177.7	$192.0	$231.0	$193.8	$95.8	$104.2
Horizontal Boring, Drilling and Milling Machines								
Table Type	23.3	35.6	38.1	41.4	53.0	51.4	20.5	35.3E
Floor Type	15.4	15.3	21.4	23.8	15.5			
Precision Boring Machines	32.0	50.2	87.8	96.3	122.1	109.7	60.5	59.4
Jig Boring Machines	14.2	16.6	30.1	30.5	40.4	32.7	14.8(a)	9.5E(a)
All Other Boring Machines	—							

p - Preliminary. r - revised. E - Estimated by NMTBA.

(a) There were no machines valued less than $2,500.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GEAR CUTTING MACHINES
Units and Value, 1977 to Date

Products	1977	1978	1979	1980	1981	1982(r)	1983(r)	1984(p)
UNITS								
TOTAL	624	878	828	931	837	445	158	205
Gear Tooth Finishing Machines (a)	384	488	646	432	254	160	90	109
Gear Hobbers-Horizontal and Vertical (b)	240	390	182	499	583	285	68	96
All Other Gear Cutting Machines	0	0	(c)	(c)	(c)	0	0	(c)
VALUE (Millions of Dollars)								
TOTAL	$61.4	$102.7	$111.2	$130.3	$133.1	$86.5	$35.8	$42.4
Gear Tooth Finishing Machines (a)	42.8	66.2	91.3	69.0	55.3	39.9	24.8	24.4
Gear Hobbers-Horizontal and Vertical (b)	18.6	36.4	19.9	61.3	77.9	46.7	10.9	18.0
All Other Gear Cutting Machines	0	0	(c)	(c)	(c)	0	0	(c)

p - Preliminary. r - Revised.

(a) Includes level gear generators.
(b) Includes gear shapers.
(c) Included in gear tooth finishing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF DRILLING MACHINES
Units and Value, 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
TOTAL	42,815	52,247	44,697	34,898	27,195	17,046	13,094	12,030
Unit Value Under $1,000(a)	36,971	49,412	41,476	31,474	24,129	15,491	12,269	11,078
Unit Value $1,000 and Over(b)	5,844	2,835	3,221	3,424	3,066	1,555	825	952
Vertical Drilling Machines								
Plain Upright	1,530	438	1,339(e)	1,089(e)	892(e)	546(e)	298(e)	332(e)
Indexing Turret Head, Heavy Duty and Other	249(d)	277(d)						
Radial Drilling Machines								
Plain and Universal Under 13"	68	54	226	232	331	163	122	89
All Other	D	D						
Deep Hole Drilling Machines	(c)	(c)	184	190	154	110		
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	301E	290	378	628	522	386	225	216
Automatic Drilling	D	598	797	(c)	(c)	272	180	315
All Other	105	D						
All Other Drilling Machines	2,202	256	297	1,285	1,167	78		
VALUE (Millions of Dollars)								
TOTAL	$107.2	$152.4	$150.5	$186.9	$139.9	$65.9	$41.1	$35.6
Unit Value Under $1,000(a)	12.8	22.2	25.9	18.6	20.2	12.0	11.3	9.7
Unit Value $1,000 & Over(b)	94.4	130.2	124.6	148.3	119.8	53.9	29.8	25.9
Vertical Drilling Machines								
Plain Upright	3.9	2.6	18.2(e)	22.7(e)	22.1(e)	6.7(e)	6.9(e)	4.9(e)
Indexing Turret Head, Heavy Duty and Other	5.9(d)	7.5(d)						
Radial Drilling Machines								
Plain and Universal Under 13"	2.1	1.7	9.7	12.6	14.0	5.3	7.4	6.7
All Other	D	D						
Deep Hole Drilling Machines	(c)	(c)	5.8	10.6	15.7	10.4		
Multiple Spindle Drilling Machines								
Adjustable Joint, Fixed Center	13.5E	11.6	21.1	26.2	20.1	10.7	6.6	6.2
Automatic Drilling	D	67.0	57.0	(c)	(c)	15.6	8.8	8.0
All Other	6.4	D						
All Other Drilling Machines	11.2	9.5	18.6	76.2	47.8	5.2		

p - Preliminary. r - Revised. D - Withheld to avoid disclosure. E - Estimate by NMTBA.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and over for 1978 to date.
(c) Included with "All Other Drilling Machines."
(d) Includes only heavy duty. Disclosure was reported for indexing turret head and other.
(e) Includes all vertical drilling machines.

Source: U.S. Department of Commerce, "Current Inuustrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units and Value, 1971 to 1978

Products	1971(c)	1972(c)	1973(c)	1974(c)	1975(c)	1976(c)	1977(c)	1978(c)
UNITS								
TOTAL	11,071	12,295	16,904	19,305	17,581	14,065	11,249	13,557
Unit Value Under $1,000 (a)	D	D	D	D	D	D	D	D
Unit Value $1,000 and Over (b)	D	D	D	D	D	D	D	D
Bench Lathes (Except Bench Turret Lathes)	D	D	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy), Floor Mounted								
Up to and Including 16" Swing Over Cross Slide	4,317	4,383	6,611	3,929(f)	3,836(f)	2,869(f)	4,510	3,640
17" to 23" Swing	139	126	285	(g)	(g)	(g)	157E	141
24" Swing and Over	61	53	52	296	321	300	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	1,804	1,965
Turret Lathes								
Bench and Floor Light Duty Type	1,052(d)	665(d)	D	D	D	D	D	D
Ram Type	100E							
Automatic Chucking Lathes								
Single Spindle	351	547	828	896	1,050	637(h)E	790(h)	1,076(h)
Multiple Spindle	231	182	270	248	214	174	214	255
Automatic Between Center Lathes	88	107	217	236	179	99	141	179
Screw (bar) Machines	933	1,107	1,434	1,676	1,189	1,051(i)E	696(i)	782(i)
Vertical Turning and Boring Mills	87E	98E	108	153	183	171	121	129
All Other	631	465	1,893	505	448	701	712	846
VALUE (Millions of Dollars)								
TOTAL	$174.9	$203.2	$299.0	$370.2	$464.2	$430.3	$436.3	$535.9
Unit Value Under $1,000(a)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Unit Value $1,000 and Over (b)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Bench Lathes (Except Bench Turret Lathes)	(D)	(D)	(e)	(e)	(e)	(e)	(e)	(e)
Manufacturing and Tool Room Lathes								
Engine & Tool Room (Light and Heavy), Floor Mounted								
Up to and Including 16" Swing Over Cross Slide	26.3	28.4	48.8	50.5(f)	55.9(f)	54.6(f)	53.4	64.0
17" to 23" Swing	6.3	4.0	10.4	(g)	(g)	(g)	11.1E	18.4
24" Swing and Over	6.5	6.5	3.8	20.7	31.8	30.6	D	
All Other Mfg. and Tool Room	D	D	D	D	D	D	18.7	23.1
Turret Lathes								
Bench and Floor Light Duty Type	15.1(d)	22.0(d)	D	D	D	D	D	D
Ram Type	2.7E							
Automatic Chucking Lathes								
Single Spindle	21.3	27.3	47.7	60.2	82.6	59.4(h)E	72.2(h)	100.9(h)
Multiple Spindle	20.9	17.0	30.1	27.6	32.3	30.6	37.9	50.2
Automatic Between Center Lathes	5.4	8.0	14.5	19.0	18.6	13.4	23.0	31.4
Screw (bar) Machines	36.3	42.8	56.9	70.1	73.7	52.9(i)E	61.4(i)	71.5(i)
Vertical Turning and Boring Mills	18.4E	20.7E	20.2	30.9	42.3	46.1	38.5	42.2
All Other	12.1	20.3	30.6	26.3	38.7	26.7	29.9	48.1

E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Average Under $2,500.
(b) Average $2,500 and over.
(c) Data for specific machines limited to machines valued at $1,000 or over through 1977, $2,500 or over beginning in 1978.
(d) Includes saddle type.
(e) Included with "All Other".
(f) Excludes 8" and under.
(g) Included with 24" Swing and Over.
(h) Includes single spindle with index turret only. Disclosure was reported for single spindle without index turret.
(i) Includes multiple spindle only. Disclosure was reported for single spindle.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF LATHES
Units and Value, 1979 to Date
(Millions of Dollars)

Products	1979	1980	1981	1982(r)	1983(r)	1984(p)
UNITS						
TOTAL	20,107	17,937	16,904	4,508	3,695	4,323
NUMERICALLY CONTROLLED						
UNIT VALUE OVER $2,500						
Turning Machines-Horizontal Spindle						
Small	1,293	1,532	977	775	793	1,002
Medium	766	768	541	308	194	259
Large	121	224	266	212	116	94
Turning Machines-Vertical Spindle Turret & Boring Machines over 30" All Other	182	215	237	194	99	169
NON-NUMERICALLY CONTROLLED						
UNIT VALUE UNDER $2,500	D	D	D	247	250	310E
UNIT VALUE $2,500 and Over	D	D	D	2,772	2,243	2,489E
Mfg, Tool Room and Engine & Tool Room (Light and Heavy)						
Floor Mounted						
0" to 16" Swing Over Cross Slide	3,200	2,211	2,657	1,374	1,184	339(a)
17" to 23" Swing 24" and Over All Other Engine & Tool Room Lathes	288	246	240	157	63	72
Turret Lathes						
Horizontal Type	916	1,063	D	D	422	D
Automatic Lathes-Single Spindle						
Bar (Screw) Machines	D	D	D	D	D	D
Chucking Machines	563	561	357	142	D	D
Automatic Lathes-Multiple Spindle						
Bar (Screw) Machines	759	848	809	293	233	334
Chucking Machines	146	176	131	54	D	D
Automatic Between Center Lathes All Other Horizontal Turning Machines	87	115	182	62	13	D
Vertical Turret Lathes and Boring Machines	246	D	D	D	D	D
All Other Vertical Turning Machines	D	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D	D
VALUE (Millions of Dollars)						
TOTAL	$650.3	$827.0	$816.8	$507.3	$320.9	$310.3
NUMERICALLY CONTROLLED						
AVERAGE OVER $2,500						
Turning Machines-Horizontal Spindle						
Small	$107.9	$167.0	$134.2	$ 87.9	$ 84.1	$107.2
Medium	147.0	168.5	128.7	74.8	41.1	50.0
Large	29.5	64.5	83.7	75.8	48.0	25.6
Turning Machines-Vertical Spindle Turret & Boring Machines over 30" All Other	63.3	81.1	94.8	94.8	51.3	29.6
NON-NUMERICALLY CONTROLLED						
UNIT VALUE UNDER $2,500	D	D	D	0.5	0.7	1.1E
UNIT VALUE $2,500 and Over	D	D	D	173.4	95.7	96.7E
Mfg, Tool Room Lathes and Engine & Tool Room (Light and Heavy)						
Floor Mounted						
0" to 16" Swing Over Cross Slide	36.8	26.2	27.9	20.5	15.9	5.8(a)
17" to 23" Swing 24" and Over All Other Engine and Tool Room Lathes	17.7	29.0	27.8	20.5	9.5	10.4
Turret Lathes						
Horizontal Type	15.0	17.3	D	D	6.8	D
Automatic Lathes-Single Spindle						
Bar (Screw) Machines	D	D	D	D	D	D
Chucking Machines	29.3	32.8	26.1	8.4	D	D
Automatic Lathes-Multiple Spindle						
Bar (Screw) Machines	80.5	89.9	99.6	40.7	24.3	29.6
Chucking Machines	25.2	33.5	30.9	14.1	D	D
Automatic Between Center Lathes All Other Horizontal Turning Machines	12.2	25.8	46.8	15.7	2.6	D
Vertical Turret Lathes and Boring Machines	9.7	D	D	D	D	D
All Other Vertical Turning Machines	D	D	D	D	D	D
All Other Non-Numerically Controlled	D	D	D	D	D	D

D - Withheld to avoid disclosure. r - Revised. p - Preliminary. E - Estimated by NMTBA.

(a) Over 8 inches to 16 inches.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (g)
Units, 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
TOTAL	95,234	110,202	107,288	97,004	91,548	58,362	56,864	59,959
Unit Value Under $1,000 (a)	80,484	91,373	89,238	79,509	76,687	48,651	50,512	51,614
Unit Value $1,000 and Over (b)	14,750	18,829	18,050	17,495	14,861	9,711	6,352	8,345
External Cylindrical Grinding Machines								
Plain	172	247	325	297	383	394	140	104
Universal	204	226	313	305	291	302	242	216
Roll and Centerless	(e)							
All Other External (c)		546	821	935	880	637	378	366
Internal Cylindrical Grinding Machines	781	(e)	(e)	(e)	(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	271	289	397	348	264	152	120	133
Reciprocating Table Type								
Vertical and Horizontal	1,632(d)	1,921(d)	2,217	2,941	1,850	1,270	862	819
Hand Surface Type	2,581	2,839	3,147	3,523	1,822	1,310	1,251	1,708
Planer Type and All Other	(e)	(e)		(e)	(e)	(e)	(e)	(e)
Bench, Floor and Snag Grinders	1,066	1,359	728	537	484	469	316	460
Tool and Cutter Grinding Machines								
Universal	2,079	2,111	2,367	2,610	2,818	1,560	851	955
Special								
Polishing and Buffing Machines								
Stand, drum & disc types	372	849	543	326	309	(e)	(e)	332
All Other Polishing	1,102	2,011	2,083	1,581	1,501	650	501	809
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	2,445	1,667	2,154	1,871	1,486	1,002	(e)	(e)
All Other Honing and Lapping Machines		362	535	370	354	(e)	(e)	(e)
All Other (f)	2,045	4,402	2,420	1,851	2,419	1,957	1,691	2,443

p - Preliminary. r - Revised.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and Over for 1978 to date.
(c) Includes chucking grinders.
(d) Includes "Horizontal" only, "Vertical" not disclosed due to confidentiality considerations.
(e) Included in "All Other."
(f) This item includes items not disclosed, see footnotes (c) and (d).
(g) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF GRINDING AND POLISHING MACHINES (g)
Value, 1977 to Date

Products	1977	1978	1979	1980	1981	1982(r)	1983(r)	1984(p)
VALUE (Millions of Dollars)								
TOTAL	$273.1	$348.6	$474.9	$555.8	$615.4	$486.7	$280.8	$334.9
Unit Value Under $1,000 (a)	12.3	11.6	16.8	16.8	17.9	13.2	12.1	13.7
Unit Value $ 1,000 and Over (b)	260.8	337.0	458.1	539.0	597.5	473.5	268.7	321.2
External Cylindrical Grinding Machines								
Plain	19.0	33.6	43.5	42.1	63.9	68.9	30.2	22.9
Universal	9.7	12.0	17.2	17.7	18.6	23.7	18.2	14.5
Roll and Centerless	(e)	64.4	107.5	132.0	160.8	93.6	44.3	47.2
All Other External (c)	50.6							
Internal Cylindrical Grinding Machines		(e)	(e)	(e)	(e)	(e)	(e)	(e)
Surface Grinding Machines								
Rotary Table Type	14.5	21.2	35.3	36.7	36.5	21.4	19.2	21.3
Reciprocating Table Type								
Vertical and Horizontal	21.1(d)	27.4(d)	35.3	49.1	37.7	35.4	14.1	24.0
Hand Surface Type	11.6	13.3	16.8	21.6	13.8	11.2	8.3	13.9
Planer Type and All Other	(e)	(e)		(e)	(e)	(e)	(e)	(e)
Bench, Floor and Snag Grinders	12.6	16.9	7.5	6.2	7.3	3.5	2.2	7.6
Tool and Cutter Grinding Machines								
Universal	19.0	19.7	26.0	32.5	36.4	31.1	28.4	35.0
Special								
Polishing and Buffing Machines								
Stand, drum & disc types	7.5	8.4	10.9	5.8	8.6	(e)	(e)	4.6
All Other Polishing	19.0	20.6	24.1	28.7	33.2	24.4	14.4	22.4
Honing and Lapping Machines								
Honing Machines (Except Gear) Internal and External	21.9	15.7	20.4	29.1	28.3	23.0	(e)	(e)
All Other Honing and Lapping Machines		9.4	10.7	11.7	13.9	(e)	(e)	(e)
All Other (f)	54.3	74.4	102.9	125.8	138.5	137.3	89.4	107.8

p - Preliminary. r- Revised.

(a) Value under $2,500 for 1978 to date.
(b) Value $2,500 and Over for 1978 to date.
(c) Includes chucking grinders.
(d) Includes "Horizontal" only, "Vertical" not disclosed due to confidentiality considerations.
(e) Included in "All Other".
(f) This item includes items not disclosed, see footnotes (c) and (d).
(g) Except gear-tooth grinding, lapping, polishing, and buffing machines.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Units, 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
TOTAL	56,855	65,239	70,922	76,770	77,220	39,946	18,246	19,574
Unit Value Under $1,000 (a)	41,163	53,432	59,852	64,819	64,347	29,990	9,609	10,816
Unit Value $1,000 and Over (b)	15,118	11,807	11,070	11,951	12,873	9,956	8,637	8,758
Broaching Machines								
Hydraulic	166	239	295	269	204	166	120	143
Mechnical								
Planers, Shapers (Except Gear) and Slotters	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	747E	433	453	556	509	562	1,032	617
Circular Cutoff Saws	879	164	134	142	145	100	102	138
Abrasive Cutoff Saws		598	499	526	497	322	219	152
Band Saw	7,080	2,889	3,874	4,223	5,316	4,066	2,971	3,565
Contour Sawing and Filing Machines	(c)	(c)	970	619	840	1,228	1,180	817
All Other	342	226						
Tapping Machines	328	264	303	286	412	373	460	967
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool change-Vert. & Horizontal	311	327	(e)	(e)	(e)	(e)	(e)	(e)
Indexing Turret								
Automatic Tool change								
Vertical	482	611						
Horizontal	408	548						
Transfer Machines								
Dial or Rotary	885	960	130	451	491	270	270	318
Way Type			91	126	64	54	46	(c)
Station Type, Transfer			574	517	349	346	138	173
Other, N.E.C.			203	218	185	122	121	(c)
Electrical Discharge Machines (EDM)	1,043	1,423	1,857	2,234	1,725	1,113	1,055	1,091
Electrochemical Machines (ECM)	2,447	3,125						
All Other Metal Cutting Machines (d)			1,687	1,784	2,046	1,234	923	777

p - Preliminary. r - Revised. E - Estimate by NMTBA.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 or more for 1978 to date.
(c) Included with "All Other."
(d) Includes items not disclosed due to confidentiality considerations, see footnote (c).
(e) Beginning with 1979 there is a new classification for Machining Centers, see page 111.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF BROACHING MACHINES, SHAPERS, SAWING AND CUTOFF MACHINES AND OTHER METAL CUTTING MACHINES

Value, 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
VALUE (Millions of Dollars)								
TOTAL	$668.1	$756.1	$836.6	$1,092.2	$1,191.5	$977.3	$360.5	$501.6
Unit Value Under $1,000 (a)	20.7	28.3	28.6	31.7	25.7	14.8	7.2	9.6
Unit Value $ 1,000 and Over (b)	647.4	727.8	808.6	1.060.5	1,165.8	962.5	353.3	492.0
Broaching Machines								
Hydraulic	20.5	25.7	31.6	33.6	36.0	38.3	15.1	19.6
Mechanical and Other								
Planers, Shapers (Except Gear) and Slotters	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
Sawing and Cutoff Machines								
Power Hack Saws	2.4E	2.2	3.4	3.4	3.2	3.4	5.2	3.2
Circular Cutoff Saws	9.9	7.6	10.6	11.6	22.2	5.1	2.3	2.5
Abrasive Cutoff Saws		3.5	3.1	4.7	5.5	3.5	2.4	2.3
Band Saws	32.0	32.1	43.6	50.9	56.8	49.6	29.1	33.9
Contour Sawing and Filing Machines	(c)	(c)	18.4	20.5	24.0	37.1	24.7	16.3
All Other	12.0	9.9						
Tapping Machines	3.8	3.3	4.8	6.7	7.2	7.7	7.0	15.6
Multi-Function N/C Machines:								
Drill, Mill, Bore:								
Manual Tool Change-Vert. & Horizontal	27.3	31.3	(e)	(e)	(e)	(e)	(e)	(e)
Indexing Turret								
Automatic Tool Change								
Vertical	54.4	71.8						
Horizontal	93.4	142.9						
Transfer Machines								
Dial or Rotary	318.9	322.5	29.9	80.0	70.1	48.0	25.6	35.7
Way Type			22.2	32.8	38.7	57.8	25.6	(c)
Station Type, Transfer			494.9	592.6	684.5	540.4	53.4	221.8
Other, N.E.C.			60.6	108.1	102.8	84.9	69.5	(c)
Electrical Discharge Machines (EDM)	19.0	29.0	45.7	78.1	66.9	35.8	48.5	46.2
Electrochemical Machines (ECM)	53.8	46.0						
All Other Metal Cutting Machines (d)			39.2	37.6	47.8	51.0	45.0	94.9

p - Preliminary. r - Revised. E - Estimate by NMTBA.

(a) Unit value under $2,500 for 1978 to date.

(b) Unit value $2,500 or over for 1978 to date.

(c) Included with "All Other."

(d) Includes items not disclosed due to confidentiality considerations, see footnote (c).

(e) Beginning with 1979 there is a new classification for Machining Centers, see page 112.

Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MACHINING CENTERS
Units and Value, 1980 to date

Products	1980	1981	1982	1983(r)	1984(p)
UNITS					
TOTAL	2,132	2,081	1,396	1,005	1,237
Unit Value over $2,500					
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	298	263	249	133	(a)
Drill, Mill, Bore-Vertical (Automatic Tool Change)					
Y-axis Travel Less Than 20 Inches	(a)	(a)	(a)	(a)	452
Y-axis Travel 20 Inches- 26 Inches	531	539	309	210	241
Y-axis Travel Over 26 Inches	238	280	193	91	122
Drill, Mill, Bore-Horizontal (Automatic Tool Change)					
Y-axis Travel Less Than 27 Inches	434	429	237	114	143
Y-axis Travel 27 Inches- 40 Inches	205	233	166	64	87E
Y-axis Travel Over 40 Inches	138	127	107	36	23E
All Other Machining Centers	288(b)	210(b)	135(b)	357(b)	169(b)E
VALUE (Millions of Dollars)					
TOTAL	$413.0	$482.7	$357.6	$182.9	$213.2
Unit Value over $2,500					
Drill, Mill, Bore-Manual Tool Change (Vertical and Horizontal)	32.1	32.4	33.2	18.5	(a)
Drill, Mill, Bore-Vertical (Automatic Tool Change)					
Y-axis Travel Less than 20 inches	(a)	(a)	(a)	(a)	38.4
Y-axis Travel 20 Inches- 26 inches	73.8	84.7	48.1	28.3	32.5
Y-axis Travel Over 26 inches	46.7	59.4	39.8	17.6	24.0
Drill, Mill, Bore-Horizontal (Automatic Tool Change)					
Y-axis Travel Less Than 27 inches	92.2	106.7	72.3	29.9	46.8
Y-axis Travel 27 Inches- 40 Inches	64.1	88.3	66.4	26.3	34.5E
Y-axis Travel Over 40 Inches	75.9	80.8	79.7	27.2	16.3E
All Other Machining Centers	28.2(b)	30.4(b)	18.1(b)	35.1(b)	20.7(b)E

p - Preliminary. r - Revised. E - Estimated by NMTBA.

(a) Included in "All Other Machining Centers."
(b) This item includes "All Other Machining Centers" and those items not disclosed due to confidentiality considerations, see footnote (a).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES
Units and Value, 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
TOTAL	12,479	14,602	15,553	17,098	17,193	7,737	7,247	7,983
Unit Value Under $1,000 (a)	D	D	1,693	1,640	1,349	921	1,036	450E
Unit Value $1,000 and Over (b)	D	D	13,860	15,458	15,844	6,816	6,211	7,533E
Knee Type Milling Machines (Except Bench)	10,365	11,872	13,216	14,852	15,275	6,507	5,969	7,354E
Horizontal								
Plain								
Universal								
Vertical & All Other Knee								
Ram Type								
Bed Type Milling Machines	644E	633						
Profile Machines and Duplicators	208	197	210	279	286	309	242	179
Die Sinking Machines	D	D	229	327	283			
All Other Milling Machines	183	114	205					
VALUE (Millions of Dollars)								
TOTAL	$160.2	$194.3	$279.8	$339.3	$436.6	$265.6	$146.5	$179.9
Unit Value Under $1,000 (a)	D	D	1.0	1.0	1.0	0.6	0.8	1.1E
Unit Value $1,000 and Over (b)	D	D	278.9	338.3	435.6	265.0	145.7	178.8E
Knee Type Milling Machines (Except Bench)	93.9	111.6	174.1	215.1	231.3	109.3	98.4	118.8E
Horizontal								
Plain								
Universal								
Vertical and All Other Knee Types								
Ram Type								
Bed Type Milling Machines	15.7E	28.9						
Profile Machines and Duplicators	18.5	14.9	66.9	96.8	157.3	155.7	47.3	60.0
Die Sinking Machines	D	D	2.2	26.3	47.0			
All Other Milling Machines	30.6	36.1	35.7					

E - Estimate by NMTBA. p - Preliminary. r - Revised. D - Withheld to avoid disclosure.

(a) Average value under $2,500 for 1978 to date.
(b) Average value $2,500 and over for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF MILLING MACHINES

Units and Value, 1980 to Date

(Millions of Dollars)

Products	1980	1981	1982	1983(r)	1984(p)
UNITS					
TOTAL	17,098	17,193	7,737	7,247	7,983
Valued under $2,500	1,640	1,349	921	1,036	450E
Valued at $2,500 and over	15,458	15,844	6,816	6,211	7,533E
General-purpose, knee or bed:					
Horizontal plain, universal and ram	13,802	14,071	5,850	5,445	D
Vertical, except ram					
Vertical ram					
All other general-purpose type milling machines					
Automatic and Manufacturing: (Return)					
Single spindle	483	356	228	177	197
Multiple spindle and special-purpose machines	567	848	429	347	D
Profile machines and duplicators	279	286	309	242	179
Die sinking and engraving machiness, drum type millers, pantograph millers, and cam millers	327	283			
All other milling machines N.E.C.					
VALUE (Millions of Dollars)					
TOTAL	$339.3	$436.6	$265.6	$146.5	$179.9
Valued under $2,500 each	1.0	1.0	0.6	0.8	1.1E
Valued at $2,500 each and over:	338.3	435.6	265.0	145.7	178.8E
General-purpose, knee or bed:					
Horizontal plain, universal and ram	155.8	140.1	64.4	71.4	D
Vertical, except ram					
Vertical ram					
All other general-purpose type milling machines					
Automatic and manufacturing:					
Single spindle	27.8	37.3	21.9	7.6	10.9
Multiple spindle and special-purpose machines	31.6	53.9	22.9	19.3	D
Profile machines and duplicators	96.8	157.3	155.7	47.3	60.0
Die sinking and engraving machines, drum type millers, pantograph millers, and cam millers	26.3	47.0			
All other milling machines N.E.C.					

p - Preliminary. r - Revised. E - Estimated by NMTBA.

Source: U.S. Department of Commerce. "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF METAL FORMING MACHINE TOOLS
Units and Value, 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
TOTAL	64,566	69,813	82,199	75,336	66,666	48,204	50,073	56,321
Punching, Shearing, Bending and Forming	41,316	43,903	47,805	46,017	40,602	29,738	31,251	34,898
Punching and Shearing (a)	5,262	4,774	5,745	5,396	5,423	3,736	2,784	3,195
Bending and Forming (a)	11,796	10,388	9,791	9,242	7,472	5,990	5,958	6,318
Presses, Including Forging(b)	16,194	16,655	24,418	20,428	18,030	11,765	9,665	10,695
Presses, Including Forging (a,b)	9,654	NA	7,432	5,764	4,123	3,147	2,419	2,611
Other Metal Forming Machine Tools	7,056	9,255	9,976	8,891	8,034	6,701	9,157	10,728
VALUE (Millions of Dollars)								
TOTAL	$662.1	$808.2	$1,026.8	$1,096.0	$1,064.3	$863.6	$580.6	$690.3
Punching, Shearing, Bending and Forming	267.9	294.3	364.6	419.1	418.9	308.8	258.7	306.3
Punching and Shearing(a)	128.2	141.3	174.3	196.7	198.1	136.5	114.2	133.0
Bending and Forming(a)	130.9	139.0	171.2	202.6	200.5	156.5	127.0	154.3
Presses, Including Forging(b)	260.7	350.9	434.0	440.8	429.6	344.8	160.8	205.1
Presses, Including Forging(a,b)	257.9	NA	422.1	429.9	418.6	338.3	156.1	200.0
Other Metal Forming Machine Tools	133.6	163.7	228.2	236.1	215.8	210.0	161.1	178.9

p - Preliminary. NA - Not Available. r - Revised.

(a) Unit value $1,000 and over through 1977 and $2,500 or more beginning in 1978. (Machine tools under $1,000 for 1974-1977 and under $2,500 for 1978 are not included so the individual items do not add to the totals.)

(b) Excludes Forging for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF HYDRAULIC AND PNEUMATIC METALWORKING PRESSES
Units and Value (a), 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	NA	NA	87	78	39	82	55	36
Column Type	170	174	433	443	347(c)	268	141	205
Open Rod Type	348	392	(b)	(b)	(b)	(b)	D	D
Gap or C-Frame								
15 Tons and Under	1,667	673	571	546	483	450	366	131
16-35 Tons			58	63	55	99		29E
Over 35 Tons			166	140	98			49
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses	D	D	34	1,137(c)	702(c)	569(c)	D	D
All other Hydraulic Presses	1,611(c)	1,363(c)	1,871(c)					
VALUE (Millions of Dollars)								
Hydraulic and Pneumatic Presses								
Vertical Single Action								
Housing or Straight Side Type	NA	NA	$18.7	$16.7	$16.3	$30.0	$12.1	$ 5.9
Column Type	$ 4.8	$16.2	9.2	11.7	8.5	7.3	7.4	11.7
Open Rod Type	8.7	9.4	(b)	(b)	(b)	(b)	D	D
Gap or C-Frame								
15 Tons and Under	8.0	7.4	4.9	5.2	4.6	9.3	4.3	1.5
16-35 Tons			1.3	1.5	1.6	4.8		0.9
Over 35 Tons			7.8	6.7	4.9			3.0E
Verticle Multiple Action, All Tonnages, Extrusion and Horizontal Presses	D	D	12.8	45.8(c)	50.0(c)	53.8(c)	D	D
All Other Hydraulic Presses	17.3(c)	32.1(c)	30.7(c)					

p - Preliminary. D - Withheld to avoid disclosure. r - Revised. E - Estimate by NMTBA. NA - Not Available.

(a) Average value $1,000 or over through 1977, $2,500 or over beginning in 1978.

(b) Data included with "All Other Hydraulic Presses."

(c) Includes horizontal and includes items not disclosed due to confidentiality considerations, see footnote (b).

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

SHIPMENTS OF MECHANICAL PRESSES
Units and Value (a), 1977 to Date

Products	1977	1978	1979	1980	1981	1982	1983(r)	1984(p)
UNITS								
Open Inclinable Gap Type								
50 Tons and Under	3,373	2,140	1,374	954	642	433	435	487
51 Tons to 120 Tons	898	929	1,000	717	444	255	205	252
120 Tons and Over			96	103	87	D	D	D
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	D	68E	59	57	90	D	D	D
201 to 300 Tons								
301 Tons and Over								
Two Point								
300 Tons and Under	292	285	313	244	154	137	D	152
301 Tons and Over	66	116	97	77	46			
Four Point	D	D	(b)	(b)	(b)	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	167	228	622	575	389	327	310	469
51 Tons and Over	D	D						
Knuckle Joint	D	D	(b)	(b)	(b)	(b)	(b)	(b)
Horizontal								
Gap and Horn Type	386	306	322	352	242	162	52	D
Bulldozers and Transfer Feed Presses	133	97	329	278	305	296	105	132
All Other Mechanical Presses								
VALUE (Millions of Dollars)								
Open Inclinable Gap Type								
50 Tons and Under	$ 16.2	$ 16.0	$ 20.0	$ 15.9	$ 13.4	$ 9.6	$ 7.9	$ 9.3
51 Tons to 120 Tons	27.2	29.3	32.4	27.5	19.1	11.0	8.0	13.4
120 Tons and Over			6.4	7.6	8.0	D	D	D
Vertical Straight-sided and Arch Frame								
Single Action								
Single Point								
200 Tons and Under	D	12.8E	13.9	13.2	20.7	D	D	D
201 to 300 Tons								
301 Tons and Over								
Two Point								
300 Tons and Under	27.4	24.3	26.7	31.3	25.5	43.1	D	27.1
301 Tons and Over	23.1	41.8	43.5	48.1	39.4			
Four Point	D	D	(b)	(b)	(b)	(b)	(b)	(b)
Automatic High Speed								
50 Tons and Under	9.9	13.4	76.5	83.7	72.2	47.6	34.9	65.0
51 Tons and Over	D	D						
Knuckle Joint	D	D	(b)	(b)	(b)	(b)	(b)	(b)
Horizontal								
Gap and Horn Type	7.1	9.7	9.2	10.0	5.6	4.5	2.1	D
Bulldozers and Transfer Feed Presses	22.1	30.5	108.1	104.9	129.0	103.3	21.3	24.7
All Other Mechanical Presses								

p - Preliminary. E - Estimate by NMTBA. D - Withheld to avoid disclosure. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.
(b) Included with "All Other Mechanical Presses."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF PUNCHING, SHEARING, BENDING AND FORMING MACHINES
Units and Value (a), 1977 to Date

Products	1977	1978	1979	1980	1981	1982(r)	1983(r)	1984(p)
UNITS								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	1,653	1,575	2,387	2,300	2,512	1,870	1,112	1,293
Punching Machines, Fixed Position & Two Axes Positioning Table	767	768	938	822	678	407	392	516
Plate Shearing Machines	1,254	1,318	1,618	1,481	1,352	942	875	913
Bar and Angle, and Rotary Shearing Machines	234	339	275	186	186	152	133	132
Other Power Operated Punching and Shearing Machines	507	551	527	607	695	365	272	341
Manually Operated Punching and Shearing Machines	847	223						
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	450	417	657	503	409	262	259	267
Bending Rolls, Angles, Bars and Shapes (Power)	1,548	1,847		231	300	116	D	(e)
Press Brakes and Folders (Power) (d)			(b)	(b)	(b)	(b)	(b)	(b)
Mechanical			566	624	548	415	574	371
Hydraulic			856	1,540	904	612	599	799
Hydro-Mechanical			622		350	262	D	314
Rotary Bending and Forming (Power)	3,523	2,334	1,655	1,275	1,200	1,051	1,483	1,815
Rotary Head and Ram Bending (Power)		1,588	1,487(c)	1,287(c)	1,017(c)	819(c)	360(c)	355(c)
Other Bending and Forming Machines (Power or Manual)	6,275	4,202	3,926	3,582	2,744	2,453	2,435	2,397
VALUE (Millions of Dollars)								
Punching and Shearing Machines								
Power operated:								
Punches, Including Combination Punching and Shearing	$15.4	$14.0	$20.8	$21.7	$26.0	$21.4	$16.3	$15.6
Punching Machines, Fixed Position & Two Axes Positioning Table	54.2	64.6	81.4	95.1	84.8	45.7	48.5	72.2
Plate Shearing Machines	44.3	46.6	53.6	61.0	65.9	55.2	40.8	38.3
Bar and Angle, and Rotary Shearing Machines	2.4	2.6	3.3	1.6	3.0	1.8	2.0	1.2
Other Power Operated Punching and Shearing Machines	10.1	13.0	15.2	17.4	18.3	12.3	6.6	5.8
Manually Operated Punching and Shearing Machines	1.8	.6						
Bending and Forming Machines								
Bending Rolls, Sheet and Plate (Power)	9.4	9.4	34.1	24.2	25.7	13.9	5.7	6.3
Bending Rolls, Angles, Bars and Shapes (Power)	43.6	52.9		13.1	15.9	13.3	D	(e)
Press Brakes and Folders (Power) (d)			(b)	(b)	(b)	(b)	(b)	(b)
Mechanical			10.8	15.2	12.5	7.7	11.1	8.6
Hydraulic			30.0	50.8	40.7	28.0	20.3	37.9
Hydro-Mechanical			10.0		9.1	5.8	D	7.1
Rotary Bending and Forming (Power)	26.5	19.7	19.3	26.4	23.6	24.4	22.3	40.3
Rotary Head and Ram Bending (Power)		14.9	16.1(c)	14.3(c)	15.1(c)	11.4(c)	8.5(c)	8.0(c)
Other Bending and Forming Machines (Power or Manual)	51.4	42.1	51.0	58.6	57.9	52.1	41.7	46.2

D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977, $2,500 or over beginning in 1978.
(b) Folders included in Other.
(c) Ram and Press Bending Only, Rotary Head is a part of Rotary Bending and Forming.
(d) The detail for press brakes is not available prior to 1979.
(e) Included in "Rotary Bending & Forming (Power)."

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

SHIPMENTS OF FORGING AND OTHER METAL FORMING MACHINE TOOLS

Units and Value (a), 1977 to Date

Products	1977	1978	1979	1980	1981	1982(r)	1983(r)	1984(p)
UNITS								
Forging Machines(Except Presses)(b)	494	533	609	631	479	383	263	198
Riveting Machines (Except Portables)	2,969	3,346	3,246	2,025	1,764	1,320	1,592	1,759
Thread Rolling Machinery	203	232	233	202	150	111	80	160
Die Casting Machines								
Under 500 Tons	NA	NA	90	123	112	75	102	168
501 Tons and Over	NA	NA	136	94	56	31		
Spinning Lathes	D	D	2,851	2,766	2,326	1,939	1,808	2,365
Marking Machines, Knurling Machines								
Electroforming & Others	2,160	2,568						
Metal Container Making Machines						1,349	1,105	891
VALUE (Millions of Dollars)								
Forging Machines (Except Presses)(b)	$51.1	$59.3	$84.7	$73.8	$79.0	$79.0	$48.0	$29.0
Riveting Machines (Except Portables)	14.6	13.7	15.8	21.9	24.3	14.6	12.7	18.5
Thread Rolling Machinery	7.1	8.3	9.4	8.9	8.5	7.2	5.0	12.3
Die Casting Machines								
Under 500 Tons	NA	NA	7.6	12.4	11.5	8.0	18.4	34.5
501 Tons and Over	NA	NA	30.9	27.1	15.1	8.7		
Spinning Lathes	D	D	75.3	88.0	73.1	46.1	35.2	44.9
Marking Machines, Knurling Machines								
Electroforming & Others	52.3	72.1						
Metal Container Making Machines						44.0	37.2	34.0

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary. r - Revised.

(a) Average value $1,000 and over through 1977 and $2,500 or over beginning in 1978.
(b) Includes forging presses for 1978 to date.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

INDUSTRIES MANUFACTURING MACHINE TOOLS

Value of Shipments, by Industry, by Type, 1977 and 1982

(Millions of Dollars)

	All Industries		Shipped by: Metal Cutting Machine Tool Industry SIC 3541	Metal Forming Machine Tool Industry SIC 3542	Special Dies, Tools, Jigs, & Fixtures Industry SIC 3544	Machine Tool Acces-sories Industry SIC 3545	Metal Working Machinery N.E.C. Industry SIC 3549	Other Industries
	1977	1982	1982					
Metal Cutting Machine Tools								
Total	$2,561	$4,155	$3,877	$25	$ 4	$75	$31	$143
Boring Machines	94	199	194	—	D	D	D	D
Drilling Machines	109	67	53	D	—	D	D	D
Gear Cutting & Finishing	67	87	D	—	—	D	—	—
Grinding & Polishing	288	515	469	1	—	D	D	D
Lathes	456	524	515	D	D	D	D	D
Milling Machines	168	265	251	10	—	D	D	D
Other Machine Tools (a)	714	1,437	1,328	D	D	D	D	D
Parts Sold Separately (b)	502	892	824	7	2	20	6	34
Not Specified	163	159	D	—	—	—	—	D
Metal Forming Machine Tools								
Total	$1,115	$1,384	$43	$1,211	$ 9	$ D	$ D	$ D
Punching, Shearing, Bending, and Forming Machines	280	317	D	287	D	—	4	D
Presses, incl. Forging Presses(c)	283	369	10	331	D	D	D	D
Other Metal Forming Tools	172	217	D	177	D	D	D	D
Parts & Rebuilt Machines	296	380	15	317	3	D	4	D
Not Specified	85	101	—	98	—	—	D	D

D - Withheld to avoid disclosure. N.E.C. - Not elsewhere classified.

(a) Includes machine tools for home workshops, laboratories, etc.
(b) Includes rebuilt machine tools.
(c) In 1982, Forging Presses are included in "Other Metal Forming Tools."

Source: U.S. Bureau of the Census, "Census of Manufactures 1982; MC82(2)-35C" and earlier issues.

Machine tools are "primary products" of the metal cutting and metal forming machine tool industries (SIC 3541 and 3542). However, other industries also manufacture machine tools as "secondary products." In turn, the machine tool industry produces some products other than machine tools.

MILITARY PRIME CONTRACT AWARDS FOR MACHINE TOOLS
Fiscal Years 1981 to Date
(Thousands of Dollars)

	Year ending June 30			
	1981	1982	1983	1984
Saws and filing machines	$ 2,142	$ 2,339	$ 2,055	$ 2,649
Machining centers and way type machines	4,155	10,035	14,981	22.485
Electrical and ultrasonic erosion machines	382	801	1,169	1,320
Boring machines	3,414	7,741	4,527	6,249
Broaching machines	839	12	5,000	5,675
Drilling machines and tapping machines	1,372	8,556	2,247	5,309
Gear cutting and finishing machines	163	151	661	269
Grinding machines	17,681	7,336	8,836	14,682
Lathes	23,645	15,003	22,220	27,241
Milling machines	12,248	9,805	11,963	10,372
Planers and shapers	400	908	123	242
Miscel. machine tools	27,594	4,416	5,799	5,755
Total metal cutting machine tools	$ 94,035	$ 67,103	$ 79,581	$102,248
Bending and forming machines	$ 2,524	$ 5,338	$ 4,022	$ 3,548
Hydraulic and pneumatic presses	2,102	1,938	1,931	8,117
Mechanical presses, power driven	755	761	1,213	356
Manual presses	430	476	474	2,400
Punching and shearing machines	4,342	3,653	3,288	3,617
Forging machinery and hammers	398	1,041	2,616	1,479
Wire and metal ribbon forming machines	474	42	80	119
Riveting machines	151	220	46	54
Miscel. secondary forming & cutting mach.	128,578	−48,489	−45,108	192
Total metal forming machine tools	$139,754	$−35,020	$−31,438	$ 19.882
Total Machine Tools	$233,789	$ 32,083	$ 48,143	$122,130

Source: Department of Defense, OASD (Comptroller), "Military Prime Contract Awards, by Service Category and Federal Supply Classification."

5

U. S. MACHINE TOOL FOREIGN TRADE

Foreign trade in machine tools has been a fact of life in the world's metalworking markets since the beginning of the industrial era. As a preeminent producer, the U.S. machine tool industry has historically exported around 15% of its annual output. However, in recent years the U.S. industry's position as an export leader has been challenged by competitors from other industrial nations and from developing nations. As a result of the combined effects of the increased competition, the worldwide recession of the past several years, and the extremely high value of the dollar relative to other currencies, U.S. machine tool exports have declined significantly since 1981. Imported foreign machine tools, on the other hand, have continued to increase their penetration of the U.S. market.

After having peaked at a value of over $1 billion in 1981, U.S. exports of machine tools fell to $615 million in 1982, fell again to $406 million in 1983, and registered only a slight gain to $409 million in 1984. Imports also declined during this time period, but by 1984 had rebounded to near the 1981 record level. After reaching a record high of $1.49 billion in 1981, imports fell to $1.25 billion in 1982, declined again to $946 million in 1983, but then registered a strong turnaround in 1984, rising 43% to $1.36 billion. Since imports rose far more rapidly than domestic shipments during 1984, the share of domestic market taken by imports continued to climb. From a level of 25% in 1981, the imports' share of American machine tool consumption had risen to 38% for 1984.

As a result of the rapid growth of imports, the machine tool trade deficit reached a new record high in 1984. Standing at $635 million for 1982 and a slightly lower $540 million for 1983, the deficits for both years exceeded the total value of U.S. machine tool exports for the first time in the industry's history. These deficits, however, pale in comparison to 1984's deficit of $947 million; a 75% increase over 1983 and a deficit that is 45% larger than the previous record in 1982. These deficits underscore the intensity of the international competitive pressures being felt by U.S. machine tool builders and bring into focus the reality of the world machine tool marketplace. Reestablishing its position in this world market is vital to the future of the U.S. machine tool industry.

United States Foreign Trade Statistics

The most widely used data on foreign trade are the Census Bureau reports on exports and imports. Exports and imports are compiled from copies of the shipper's own declaration filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Freight, insurance, and other charges are included, thus giving exports a value higher than that of the machine tool at the manufacturer's plant.

The Census data include shipments by manufacturers and by others such as dealers and distributors. They also include exports of rebuilt machine tools, replacement parts, and machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking.

While the Census export figures tend to show a value higher than the value of the machines at the manufacturer's plant, import figures show values considerably lower than those paid by the purchaser of foreign machine tools. Values are, in general, based on the market value, or price, in the foreign country at the time of exportation and include the cost of containers and coverings as well as other charges and expenses incidental to placing the merchandise into condition for shipment to the United States. However, they exclude import duties, insurance, ocean freight, and other charges incidental to the arrival of the goods in the United States.

As a result of these and other factors inflating the "value" of the exports and deflating the "value" of the imports, the impact of imports is greater than that shown in most tables in this chapter. The negative balance of trade, correspondingly, is larger than shown.

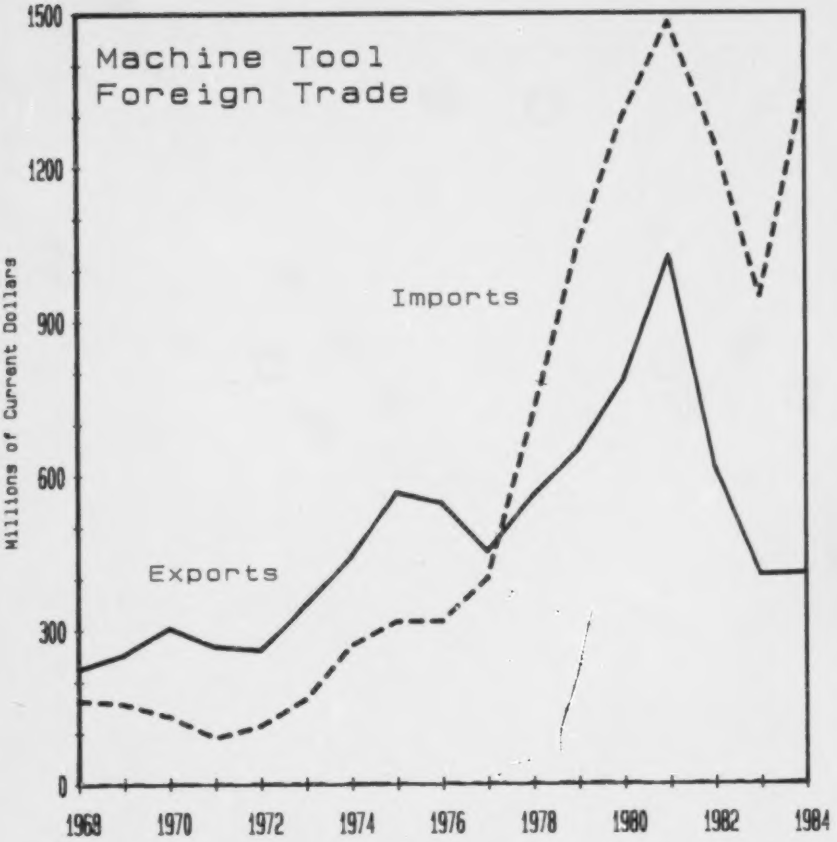
There are two additional export series with a more limited scope but considered more accurate by the industry.

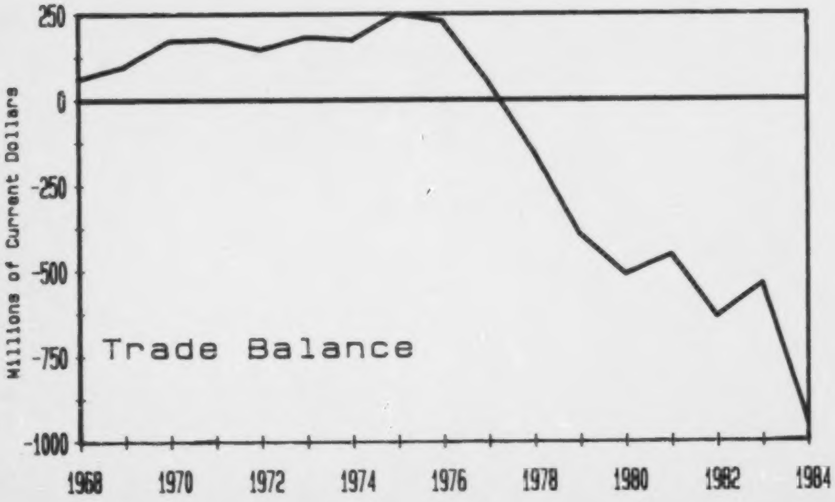
The first is a series on foreign orders and shipments that is part of the NMTBA "Industry Estimates of New Orders, Cancellations, Shipments, and Backlog," published monthly for the entire industry (see Chapter 4 for details on this report).

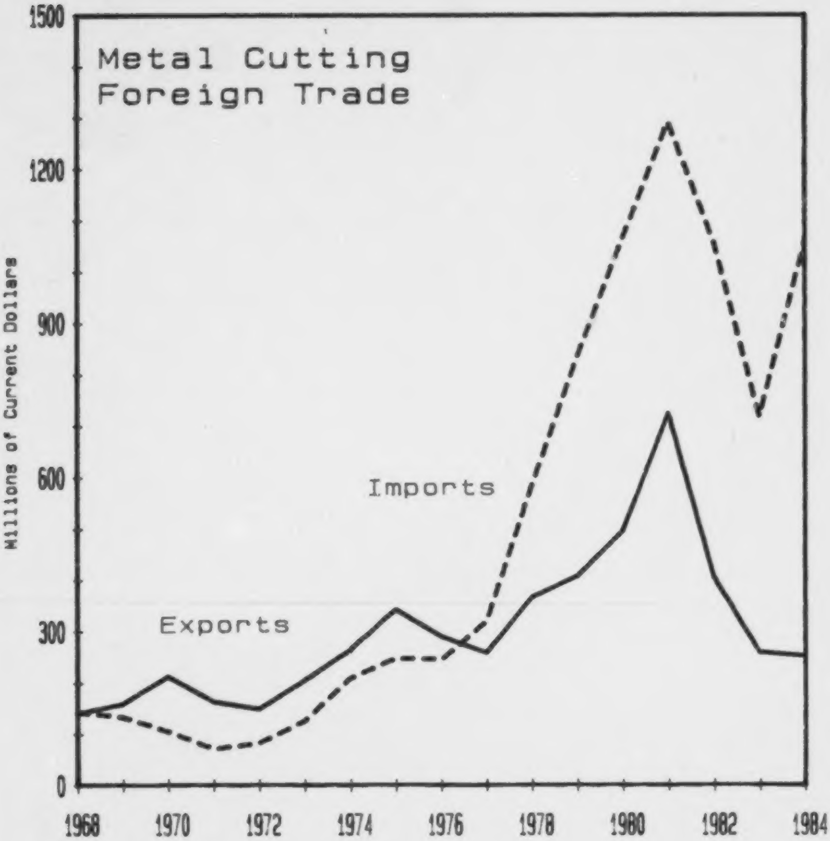
The other is the series on exports, based on manufacturers' shipments for export, published in the MQ-35W series by the Department of Commerce (see Chapter 4 for details). This report shows manufacturers' shipments of new and complete machine tools for 12 major machine tool categories. It also shows the historical quantity and value of exports for about 15 selected types of machine tools through 1972, but only the value of exports from 1973 forward.

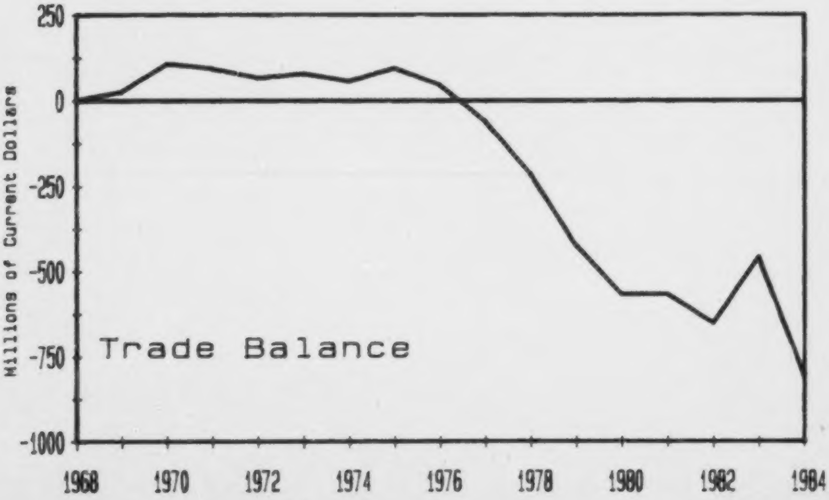
The two major reasons the Census data are the most widely used in spite of their shortcomings are that (1) the Census series on imports is the only one available, and (2) the two Census series on exports and imports include a similar broad "universe" (new, used, and rebuilt machines and home-workshop type machine tools).

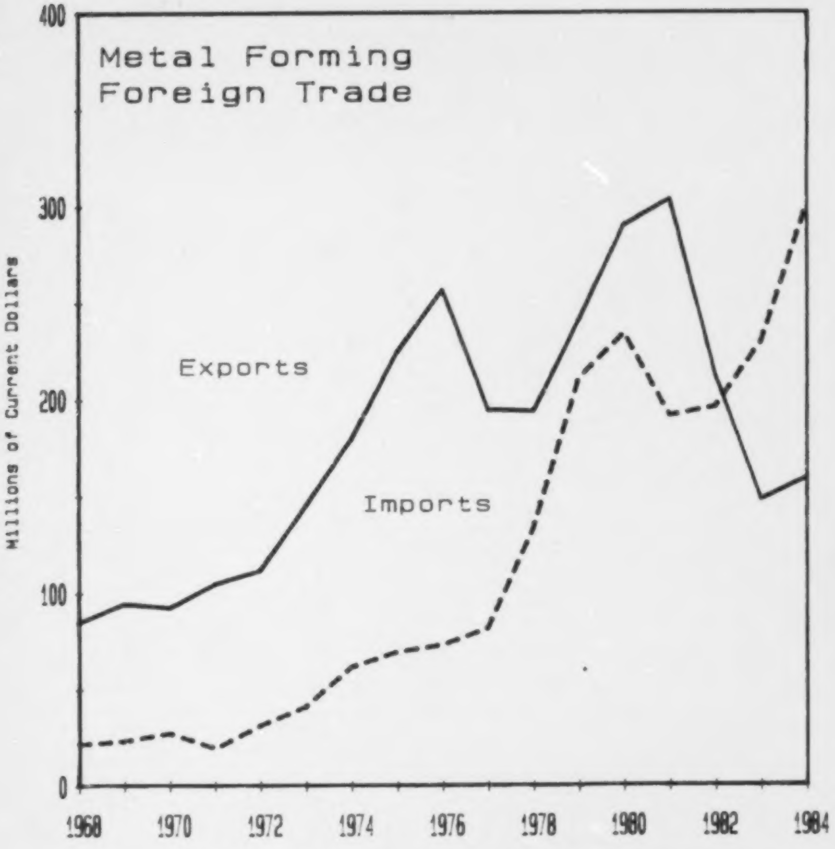
Beginning with 1980 data, the commodity descriptions and classification numbers for machine tools were revised. Although the machine tool categories differ slightly, the resulting TSUSA import and Schedule B export classification codes are comparable and permit direct comparisons of foreign trade by product types. Foreign trade data are also comparable to U.S. production data (MQ-35W, see Chapter 4), permitting the calculation of U.S. consumption of machine tools for a variety of product types.

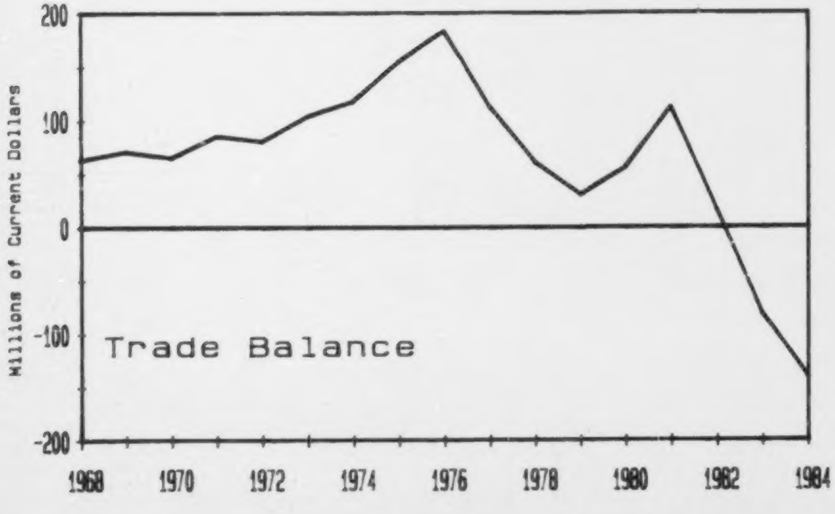

Machine Tool
Foreign Trade
Imports
Exports
Millions of Current Dollars
1500
1200
900
600
300
0
1968
1970
1972
1974
1976
1978
1980
1982
1984


Trade Balance
Millions of Current Dollars
250
0
-250
-500
-750
-1000
1968
1970
1972
1974
1976
1978
1980
1982
1984


Metal Cutting
Foreign Trade
Imports
Exports
Millions of Current Dollars
1500
1200
900
600
300
0
1968
1970
1972
1974
1976
1978
1980
1982
1984


Trade Balance
Millions of Current Dollars
250
0
-250
-500
-750
-1000
1968
1970
1972
1974
1976
1978
1980
1982
1984


Metal Forming
Foreign Trade
Exports
Imports
Millions of Current Dollars
400
300
200
100
0
1968
1970
1972
1974
1976
1978
1980
1982
1984


Trade Balance
Millions of Current Dollars
200
100
0
-100
-200
1968
1970
1972
1974
1976
1978
1980
1982
1984

U.S. MACHINE TOOL IMPORTS AS A PERCENTAGE OF U.S. MACHINE TOOL CONSUMPTION

By Type of Complete Machines Valued Over $2,500 (a), 1976 to Date

	1976	1977	1978	1979	1980	1981	1982(r)	1983(r)	1984(p)
Machine Tools	16.4	16.8	20.6	22.6	23.3	24.9	26.4	33.7	38.0
Metal Cutting	16.1	17.5	21.6	23.0	23.6	26.1	27.4	33.6	38.8
Boring Machines	28.6	34.2	39.3	26.0	25.0	29.3	25.2	29.4	29.9
Drilling Machines	17.2	19.8	13.8	16.8	15.7	21.7	33.3	31.6	53.5
Gearcutting Machines	35.6	28.8	31.7	32.9	29.8	31.1	28.1	36.7	41.8
Grinding Machines	NA	NA	NA	NA	23.4	22.6	22.6	28.9	30.2
Lathes	19.1	24.0	33.1	37.3	36.0	41.3	45.9	38.8	51.3
Milling Machines	17.8	16.8	22.6	24.5	30.2	23.9	26.5	28.5	34.8
Machining Centers	NA	NA	NA	11.3	20.8	31.3	36.9	49.3	56.0
Metal Forming	17.8	14.7	17.4	21.1	22.1	19.4	22.5	33.8	35.8
Punching & Shearing Machines	NA	NA	NA	NA	23.3	25.7	34.6	27.5	43.4
Bending & Forming Machines	NA	NA	NA	NA	17.5	16.3	20.7	24.5	29.4
Presses	NA	NA	NA	NA	16.0	11.6	12.4	29.3	30.1
Forging Machines	NA	NA	NA	NA	28.5	21.5	25.3	49.8	55.3
Total NC Machines	NA	NA	NA	NA	23.4	32.7	35.1	38.4	48.4

NA - Not Available. p - preliminary. r - Revised.

(a) Based on shipments of complete machine tools with values greater than $1,000 for 1975–1977 and $2,500 for 1978 to date.

Source: U.S. Dept. of Commerce: "Current Industrial Reports, Series MQ-35W, Metalworking Machinery," and U.S. Bureau of the Census, "IM 146" and "EM 522."

UNITED STATES PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF NEW COMPLETE MACHINE TOOLS(a), 1963 to Date

(Thousands of Dollars)

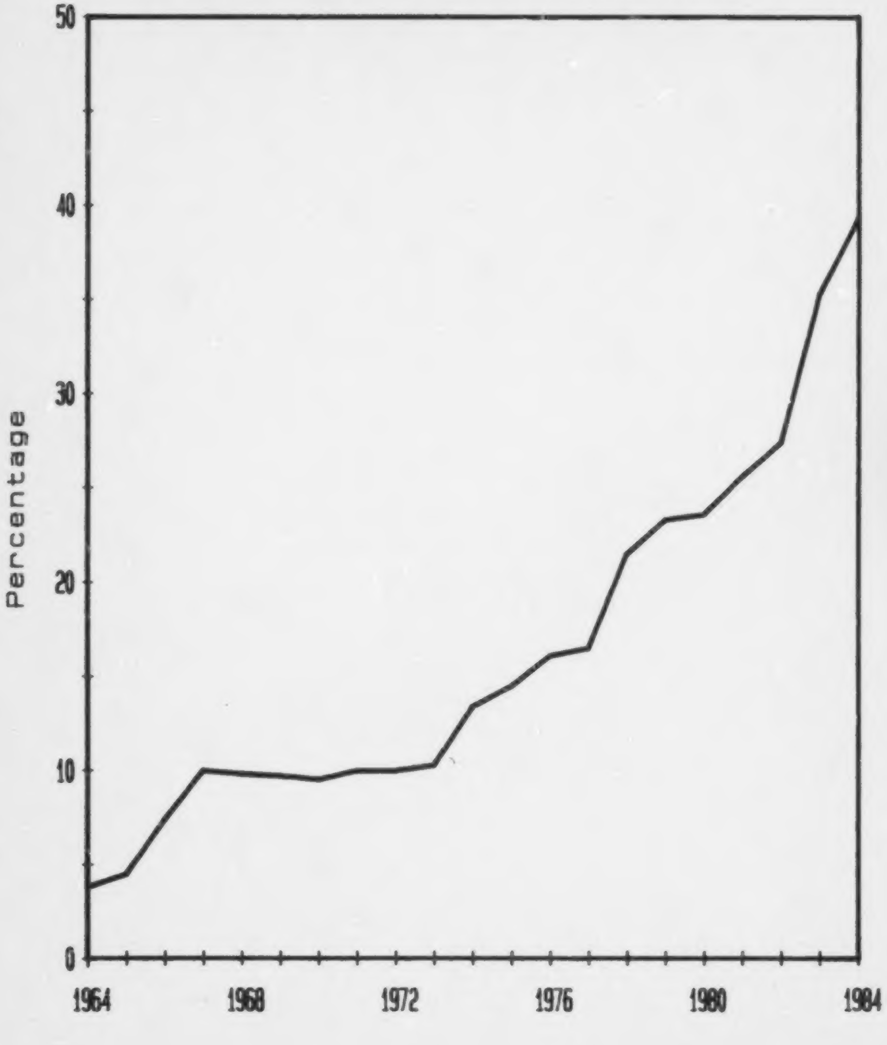
Year	Production	Exports	Imports	Domestic Consumption
1963	$ 946,083	$185,443	$ 37,679	$ 798,319
1964	1,185,380	254,511	36,364	967,233
1965	1,429,650	222,437	56,293	1,263,506
1966	1,680,014	208,909	117,748	1,588,853
1967	1,826,432	224,672	178,205	1,779,965
1968	1,722,727	216,552	163,576	1,669,751
1969	1,692,188	242,427	156,122	1,605,883
1970	1,551,777	292,086	131,826	1,391,517
1971	1,057,870	251,532	90,085	896,423
1972	1,269,302	238,135	113,998	1,145,165
1973	1,787,850	325,494	167,057	1,629,413
1974	2,165,937	410,510	270,740	2,026,167
1975	2,406,082	536,659	317,578	2,187,001
1976	2,178,265	514,942	318,304	1,981,627
1977	2,453,423	426,729	400,904	2,427,598
1978	3,142,594	533,094	715,282	3,324,782
1979	4,064,045	619,111	1,043,768	4,488,702
1980	4,812,349	734,135	1,259,802	5,338,016
1981	5,111,253	949,553	1,431,457	5,593,157
1982(r)	3,804,250	574,567	1,217,718	4,447,401
1983(r)	2,044,849	359,037	921,083	2,606,895
1984(p)	2,412,504	373,457	1,318,964	3,358,011

p - Preliminary. r - Revised.

(a) Production figures are those reported by domestic manufacturers in the MQ-35W. Import and export figures are taken from the Department of Commerce's "IM146" and "EM 522" reports. These figures reflect data for machine tools of all values but do not include the value of used and rebuilt machines.

Source: NMTBA, "Current Industrial Reports; Metalworking Series, MQ-35W," U.S. Department of Commerce Trade Statistics.

U.S. Machine Tool Imports as a Percentage of U.S. Machine Tool Consumption



The government import statistics used on this and the previous page represent machine tool values in the originating foreign country. They exclude import duties, freight insurance and other charges incurred in bringing the machines to the United States and thus understate the imports' actual cost. A conservative adjustment reflecting these value-adding charges results in a slightly higher proportion of U.S. consumption being accounted for by imports. For example, the adjusted 1984 import share of U.S. machine tool consumption was 44.3% as compared with an unadjusted share of 38.0%.

U.S. IMPORTS OF MACHINE TOOLS (a)

Major Countries of Origin, 1973 to Date

(Millions of Dollars)

Country of Origin	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
TOTAL	$167.1	$270.7	$317.6	$318.3	$400.9	$715.3	$1,043.8	$1,298.5	$1,482.9	$1,253.3	$946.5	$1,356.6
Austria	.9	1.8	3.2	2.0	1.0	2.3	3.7	2.3	2.1	15.8	30.0	4.2
Belgium	1.5	5.3	6.4	3.1	4.9	8.0	12.6	16.7	18.5	9.1	7.1	6.7
Czechoslovakia	1.1	2.6	2.8	3.5	2.9	3.9	4.6	5.7	4.7	2.0	.6	1.7
Denmark	.7	1.4	1.1	1.0	.7	2.5	3.3	3.7	2.9	2.2	2.8	5.2
France	9.9	13.4	16.2	9.5	9.7	17.4	21.4	24.9	26.5	12.9	10.5	13.9
Germany (East)	.3	.3	.6	.8	.7	1.8	1.9	2.0	2.9	3.1	2.1	1.5
Germany (West)	51.6	78.0	96.0	93.3	91.2	154.8	197.0	235.9	192.3	204.6	125.7	205.7
Italy	10.1	16.8	15.5	14.6	15.1	25.4	37.5	44.1	42.9	45.0	49.3	51.3
Netherlands	1.7	2.4	1.3	1.1	1.9	2.7	5.5	6.1	4.9	2.6	5.7	9.0
Norway	.3	.6	.4	.1	.6	.4	.6	.3	.8	1.0	.1	.9
Poland	1.7	5.2	2.2	2.8	7.2	12.8	19.2	15.6	15.8	7.5	2.1	1.0
Spain	4.2	6.8	6.4	6.9	7.7	13.4	20.6	27.1	24.3	20.6	11.6	16.2
Sweden	5.5	8.9	9.9	8.4	11.5	18.3	31.3	29.3	28.3	23.4	15.3	19.2
Switzerland	20.0	29.3	27.0	28.6	35.3	57.6	66.0	81.5	78.4	71.8	54.7	78.4
United Kingdom	21.9	31.0	39.3	32.0	46.1	74.9	96.9	117.3	136.1	107.5	66.4	74.7
Canada	9.5	12.7	15.0	14.9	19.2	27.0	34.2	47.9	44.0	36.6	29.4	40.8
Japan	22.0	47.4	62.6	67.3	105.7	220.6	353.3	492.0	687.5	529.2	414.9	683.3
Taiwan	.8	2.4	2.7	13.0	22.6	48.8	85.7	93.6	102.4	90.9	83.4	99.2
Other Countries	3.3	4.4	8.8	15.4	16.9	22.5	48.5	52.5	67.6	67.5	34.8	43.7

(a) Data does not include parts, but does include "Used and Rebuilt."

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.

U.S. IMPORTS OF CUTTING AND FORMING MACHINE TOOLS (b)

Major Countries of Origin, 1973 to Date

(Millions of Dollars)

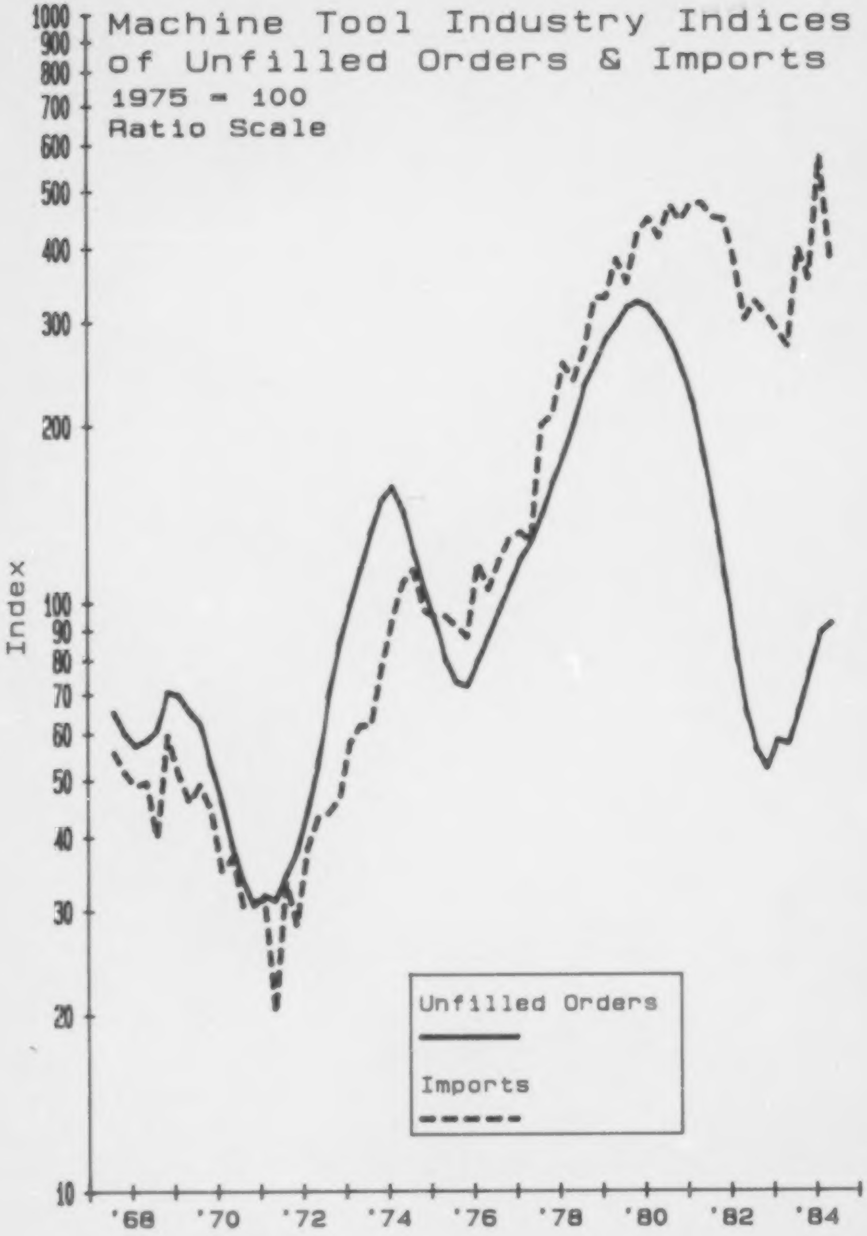
Country of Origin	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
CUTTING TOTAL	$126.0	$209.1	$248.1	$245.3	$319.2	$582.2	$833.1	$1,064.4	$1,291.5	$1,057.4	$716.9	$1,056.7
Austria	.7	1.3	1.6	1.9	1.0	1.8	2.6	1.4	2.0	3.1	4.2	2.6
Belgium	.8	1.7	2.6	1.2	4.3	4.5	6.2	8.0	10.8	5.6	3.0	.5
Czechoslovakia	1.1	2.6	2.8	3.5	2.9	3.9	4.4	5.5	4.6	2.0	.6	1.7
Denmark	.4	.7	.6	.9	.5	1.8	1.5	2.4	1.3	1.2	1.4	2.8
France	8.7	11.6	14.9	7.8	9.7	13.8	17.5	22.3	20.6	9.3	6.6	8.5
Germany (East)	.3	.3	.6	.7	.7	1.6	1.8	1.9	2.9	3.1	2.0	1.5
Germany (West)	35.3	53.0	69.0	59.7	60.3	104.0	117.0	150.2	148.4	155.0	91.6	137.1
Italy	6.9	11.6	11.3	11.3	11.1	19.6	23.9	34.2	31.6	36.5	21.4	38.5
Netherlands	1.3	1.9	1.0	1.0	1.0	2.4	4.3	5.4	4.3	2.1	2.6	5.9
Poland	1.7	5.0	2.2	2.8	7.2	12.6	19.1	15.5	15.8	7.5	2.0	1.0
Spain	4.0	6.4	6.0	6.2	7.3	13.0	18.9	24.3	21.9	19.0	9.5	13.6
Sweden	4.7	7.8	7.5	7.0	9.6	12.9	21.7	19.9	19.9	14.9	7.7	11.9
Switzerland	14.3	23.1	20.9	22.5	28.1	47.7	53.9	65.9	65.4	61.1	40.5	66.1
United Kingdom	117.1	26.6	34.2	27.8	39.2	64.0	86.7	103.8	120.5	94.1	56.6	60.8
Canada	5.7	7.7	8.5	8.9	11.0	16.2	18.1	29.1	28.2	22.4	12.7	17.2
Japan	19.1	41.0	53.1	54.8	89.1	193.7	305.9	433.4	627.4	467.8	340.0	550.6
Taiwan	.8	2.4	2.7	12.8	22.5	47.9	85.3	93.1	101.6	89.9	82.4	97.3
Other Countries	3.0	3.9	8.6	14.5	13.7	20.6	44.3	48.1	64.3	62.8	31.9	38.8
FORMING TOTAL	$41.1	$61.6	$69.4	$73.0	$81.7	$133.1	$210.7	$234.1	$191.4	$196.0	$229.5	$299.9
Austria	.2	.5	1.6	.1	(a)	.5	1.1	.9	.1	12.8	25.7	1.5
Belgium	.7	3.6	3.8	1.9	.5	3.5	6.4	8.7	7.7	3.5	4.1	6.2
Germany (West)	16.3	25.0	27.0	33.6	30.9	50.7	80.1	85.7	44.0	49.6	34.1	68.6
France	1.2	1.8	1.4	1.7	2.4	3.6	4.0	2.5	5.9	3.6	3.9	5.4
Italy	3.2	5.2	4.2	3.2	4.0	5.8	13.6	9.9	11.3	8.6	27.9	12.8
Sweden	.8	1.1	2.4	1.4	2.0	5.4	9.6	9.3	8.3	8.5	7.6	7.3
Switzerland	5.7	6.3	6.1	6.2	7.2	9.9	12.1	15.7	13.0	10.7	14.2	12.3
United Kingdom	4.8	4.4	5.1	4.2	6.9	10.9	10.2	13.6	15.6	13.5	9.8	13.9
Canada	3.8	5.0	6.5	6.0	8.3	.3	16.1	18.8	15.8	14.2	16.7	23.5
Japan	2.9	6.4	9.5	12.5	16.6	26.9	47.4	58.6	60.1	61.5	74.9	132.7
Other Countries	1.4	.5	1.8	2.2	2.9	15.6	10.1	10.4	9.6	9.5	10.6	15.6

(a) Less than $50,000; included in "Other Countries."

(b) Data does not include parts. See previous page.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.



Machine Tool Industry Indices
of Unfilled Orders & Imports
1975 = 100
Ratio Scale
Index
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
'68
'70
'72
'74
'76
'78
'80
'82
'84
Unfilled Orders
Imports

UNITED STATES IMPORTS OF MACHINE TOOLS AND PARTS

By Machine Classification, 1973 to Date

(Millions of Dollars)

Machine Classification	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
GRAND TOTAL	$211.6	$330.3	$382.4	$383.3	$482.2	$832.4	$1,269.5	$1,556.9	$1,712.9	$1,489.4	$1,100.2	$1,652.7
METAL CUTTING	164.6	261.3	303.0	293.6	386.7	681.6	1,027.6	1,282.2	1,485.1	1,258.1	836.9	1,316.5
Complete Machines	126.0	209.1	248.1	245.3	319.2	582.2	833.1	1,029.2	1,245.6	1,025.7	697.0	1,025.1
Gear Cutting or Hobbing	4.7	10.7	20.7	16.9	13.5	25.9	28.4	29.4	37.0	25.8	13.8	16.1
Drilling	5.6	8.8	9.4	15.3	19.6	18.7	25.0	27.2	26.4	20.7	9.9	17.9
Milling	12.4	19.8	23.3	25.9	27.9	47.7	83.1	138.1	124.7	87.7	52.5	83.4
Machining Centers	(a)	(a)	(a)	(a)	(a)	22.0	39.6	93.4	195.7	188.9	164.9	248.0
Boring and Vertical Turret Lathes	14.4	28.8	41.1	41.0	51.8	65.9	70.7	76.9	86.7	78.8	44.6	49.7
Lathes (Exc. Vertical Turret Lathes)	45.7	73.1	77.0	77.0	113.9	219.4	353.6	380.0	479.8	338.6	165.7	268.1
Grinding	20.0	32.4	34.5	32.2	39.2	68.1	85.2	150.5	137.2	117.6	89.6	118.5
Other	23.3	35.5	42.5	37.1	53.3	63.6	82.4	84.4	87.2	98.7	72.8	129.4
Metal Cutting, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	50.9	65.1	50.0	70.9	68.9	83.2	91.8
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	(b)	(b)	35.2	45.9	31.7	19.9	31.6
Parts	38.6	52.2	54.8	48.3	67.5	99.5	194.5	217.8	193.6	200.7	120.0	259.8
METAL FORMING	47.0	68.9	79.4	89.7	95.5	150.7	241.9	274.7	227.8	231.3	263.3	336.1
Complete Machines	41.1	61.6	69.4	73.0	81.7	133.1	210.7	230.6	185.9	192.0	224.1	293.9
Metal Forming, $2,500 and Under	(b)	(b)	(b)	(b)	(b)	4.1	4.5	3.9	4.5	4.6	5.2	8.1
Used and Rebuilt	(b)	(b)	(b)	(b)	(b)	(b)	(b)	3.5	5.5	3.9	5.5	6.0
Parts	5.9	7.3	10.0	16.7	13.8	17.6	31.2	40.6	36.3	35.4	33.8	36.3

(a) Included in "Other Metal Cutting Machine Tools."

(b) Included in respective machine classifications.

Note: Individual items may not add to totals due to rounding. This table is based on a set of classifications which was expanded in 1978. A separate table on the following page reports import data for 1983 and 1984 using the more detailed machine tool categories.

Source: U.S. Department of Commerce, Bureau of the Census, "IM 146" and earlier publications.

It should be noted that machine tool imports, as reflected in government statistics, are actually undervalued. They reflect values in the country of origin and do not include ocean freight, insurance, dealer commissions or import duties. The purchaser in this country is paying significantly more for imported machine tools than is reported in the import statistics.

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1983 and 1984
(Value in Thousands of Dollars)

Machine Classification	1983		1984	
	Units	Value	Units	Value
GRAND TOTAL	1,770,995	$836,914(a)	1,357,119	$1,316,525(a)
Complete New Machines	1,760,644	$697,015	1,347,975	$1,025,079
Gear Hobbers	44	6,834	106	8,304
Gear Shapers	5	616	15	2,061
Gear Cutting Machines, N.E.C.	19	996	9	855
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	1,295	90,284	1,833	132,506
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	53	6,437	108	11,473
Horizontal Machining Centers, ATC, NC	303	37,050	652	74,036
Machining Center, NC, N.E.C.	285	31,163	318	29,987
Single Station and Multi-Station Transfer Machines	7	1,640	50	12,747
Way Type Machines (Unit Heads)	—	—	—	—
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	13	3,473	18	3,883
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	40	8,047	39	5,131
Vertical Boring-Drilling-Milling Machines, NC	24	2,707	74	7,612
Horiz. Boring-Drilling-Milling Machines, non-NC	45	4,734	59	6,258
Vertical Boring-Drilling-Milling Machines, non-NC	873	6,766	268	7,612
Drilling Machines, NC	57	2,257	94	5,389
Drilling Machines, Multi-Spindle, non-NC	15	301	66	1,271
Drilling Machines, Radial, non-NC	218	1,867	343	2,316
Drilling Machines, Upright, Single Spindle, non-NC	101	577	75	463
Drilling Machines, non-NC, N.E.C.	194	4,908	338	8,422
Milling Machines, NC	221	13,559	300	34,709
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	94	4,364	46	634
Milling Machines, Knee Type, non-NC	1,538	13,301	2,825	18,231
Milling Machines, Bed Type, non-NC	255	4,709	501	6,118
Milling Machines, non-NC, N.E.C.	1,552	16,539	2,799	23,757
Vertical Boring Machines, incl. VTL's NC	19	3,854	22	4,706
Vertical Boring Machines, incl. VTL's, non-NC	159	6,175	180	5,419
Boring Machines, NC, N.E.C.	6	1,683	14	2,242
Boring Machines, non-NC, N.E.C.	148	7,193	170	6,817
Horizontal Lathes, NC, Less Than 25 HP	1,245	65,377	2,059	106,299
Horizontal Lathes, NC, 25-50 HP	310	26,688	649	55,940
Horizontal Lathes, NC, Over 50 HP	54	6,841	50	6,235
Horizontal Engine & Toolroom Lathes, non-NC	3,248	24,037	3,253	24,716
Automatic Chucking Lathes, Single Spindle, non-NC	98	3,620	92	2,878
Automatic Chucking Lathes, Multi-Spindle, non-NC	54	1,289	123	3,376
Automatic Bar Machines, Single Spindle, non-NC	52	1,034	148	2,548
Automatic Bar Machines, Multi-Spindle, non-NC	24	2,057	114	6,613
Horizontal Lathes, non-NC, N.E.C.	415	6,506	334	6,869
Vertical Lathes, excl. VTL's, NC	213	14,572	423	27,017
Vertical Lathes, excl. VTL's, non-NC	949	13,656	1,774	25,603
Gear Tooth Grinding & Finishing Machines	85	5,401	198	6,894
Tool & Cutter Grinding Machines, NC	26	1,684	48	3,550
Tool & Cutter Grinding Machines, non-NC	686	10,833	1,168	16,556
Honing & Lapping Machines	132	3,039	160	4,814
Grinding Machines, Flat Surface, NC	37	5,926	77	6,527
Grinding Machines, Flat Surface Reciprocating Table, non-NC	363	5,324	764	7,454
Grinding Machines, Flat Surface, non-NC, N.E.C.	697	12,405	1,149	18,873
Grinding & Polishing Machines, NC, N.E.C.	41	6,876	78	9,901
External Grinding Machines, non-NC	265	13,585	283	11,270
Internal Grinding Machines, non-NC	146	5,027	107	3,791
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	134	4,388	187	5,218
Grinding Machines, non-NC, N.E.C.	755	20,536	1,228	30,564
Traveling Wire Electrical Discharge Machines	420	17,923	746	38,425
All Other Electrical Discharge Machines	351	14,098	505	20,932
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	25	3,493	37	3,644
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	78	4,165	144	5,148

Footnotes at end of Table.

U.S. IMPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1983 and 1984

(Value in Thousands of Dollars)

(Continued)

Machine Classification	1983		1984	
	Units	Value	Units	Value
Metal Cutting Machine Tools, NC, N.E.C.	25	$ 1,778	17	$ 1,825
Sawing & Cut-off Machines, non-NC	1,016	17,804	1,480	20,531
Broaching Machines, non-NC	14	755	11	1,769
Metal Cutting Machine Tools, non-NC, N.E.C.	438	10,918	979	24,424
Metal Cutting Machine Tools, Less Than $2,500	1,740,665	83,231	1,318,268	91,768
Metal Cutting Machine Tools, Used or Rebuilt	10,351	19,900	9,144	31,625
Parts	—	119,980	—	259,821

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

U.S. IMPORTS OF METAL FORMING MACHINE TOOLS AND PARTS
By Machine Classification, 1983 and 1984

(Value in Thousands of Dollars)

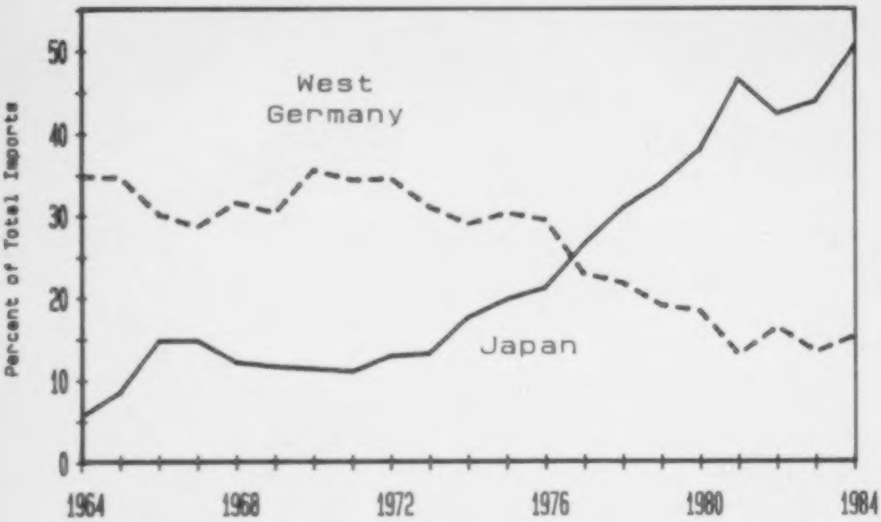
Machine Classification	1983		1984	
	Units	Value	Units	Value
GRAND TOTAL	47,202	$263,303(a)	62,150	$336,141(a)
Complete New Machines	46,844	$224,068	61,566	$293,885
Die Casting Machines	138	10,562	357	11,108
Punching & Shearing Machines, incl. Combination, NC	200	19,046	462	51,077
Shearing Machines, non-NC	584	10,335	706	12,521
Punching & Combination Punching & Shearing Machines, non-NC	450	6,082	652	11,104
Bending, Folding, Straightening & Flattening Machines, NC	86	7,430	170	8,228
Press Brakes, non-NC	473	8,568	978	24,533
Bending Rolls, Ram & Press Bending Machines, non-NC	144	2,767	146	2,529
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	790	16,112	994	20,955
Metal Forming Machine Tools, NC, N.E.C.	19	920	167	10,052
Mechanical Presses, non-NC	152	25,246	386	22,768
Hydraulic Presses, Vertical, Single Action, non-NC	106	6,500	79	2,116
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	299	20,454	430	45,691
Headers & Upsetters, non-NC	66	5,822	183	15,896
Forging Machines, non-NC, N.E.C.	55	33,930	106	5,457
Metal Forming Machine Tools, non-NC, N.E.C.	1,305	45,024	1,560	41,692
Metal Forming Machine Tools, Less Than $2,500	41,959	5,231	54,211	8,111
Metal Forming Machine Tools, Used or Rebuilt	358	5,470	584	5,974
Parts	—	33,765	—	36,282

N.E.C. - Not Elsewhere Classified.

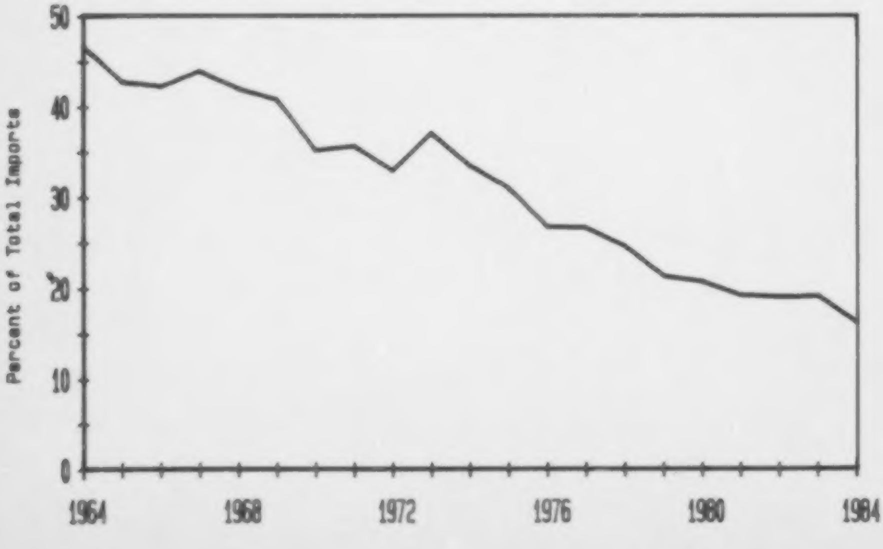
(a) The data may not add to totals due to rounding.

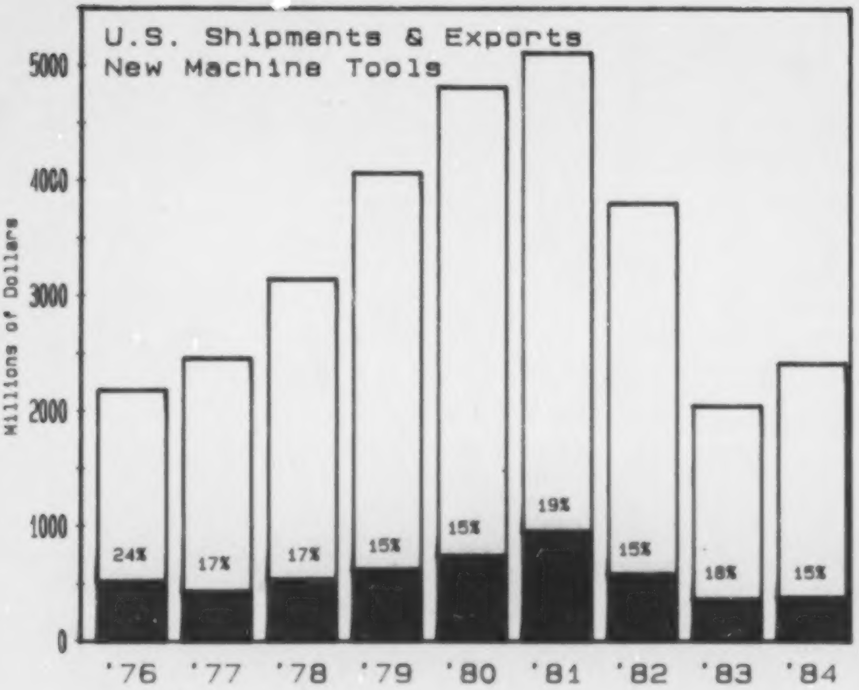
Source: U.S. Department of Commerce, Bureau of Census, "IM 146."

U.S. Machine Tool Imports From West Germany and Japan

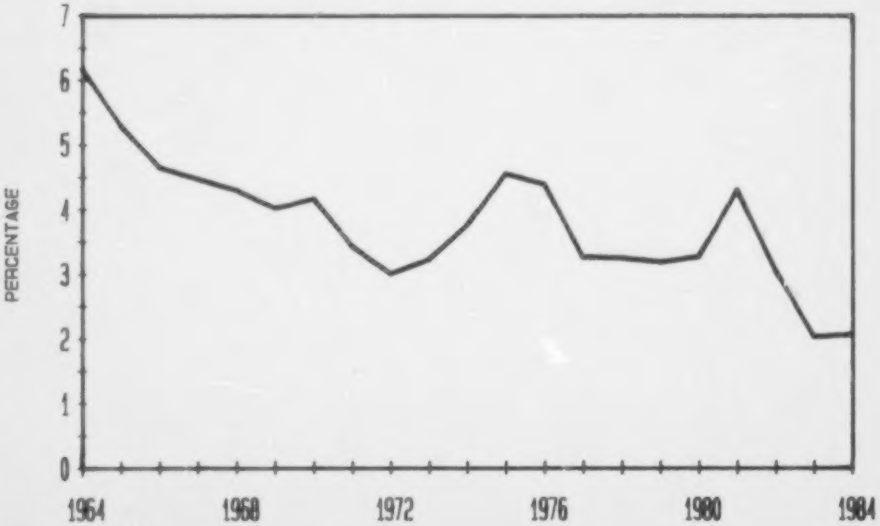


U.S. Machine Tool Imports from France, Italy, Switz. & the U.K.





U.S. MACHINE TOOL EXPORTS
Percent of World Machine Tool Consumption



U.S. EXPORTS OF MACHINE TOOLS
Cutting and Forming By Destination, 1973 to Date

(Millions of Dollars)

Destination	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
GRAND TOTAL	$350.5	$443.8	$567.6	$546.5	$452.1	$560.2	$648.8	$785.3	$1,027.6	$615.0	$406.0	$409.3
EUROPE	131.0	192.2	242.2	194.1	163.8	201.3	212.3	228.0	231.8	163.6	128.6	110.0
Austria	.8	2.0	.5	1.5	1.8	.3	.9	1.8	1.3	1.2	2.3	.2
Belgium	5.7	7.8	9.8	5.0	7.8	8.7	4.1	3.6	4.9	2.9	1.5	4.3
Denmark	.9	1.1	1.2	2.1	2.5	1.7	3.1	3.1	1.3	1.4	.4	.8
Finland	.2	1.1	1.0	2.0	.9	.6	1.9	1.5	1.8	6.3	1.1	.4
France	16.4	11.9	15.9	18.9	10.8	12.2	20.4	21.3	29.2	19.2	12.5	11.6
Germany, West	12.2	16.9	13.8	16.0	23.7	29.7	28.5	33.7	35.2	21.8	30.9	21.4
Greece	.5	.9	1.7	1.1	.5	1.2	4.5	1.1	1.4	1.6	.3	.3
Ireland	1.3	1.0	2.1	1.5	1.0	2.0	2.9	3.5	11.4	4.2	4.5	4.0
Italy	12.8	22.9	11.6	13.8	13.5	11.0	17.5	13.4	16.7	14.9	15.5	6.8
Netherlands	4.1	5.2	4.3	3.6	4.5	4.8	5.3	7.8	7.4	3.3	2.7	2.0
Norway	.4	.3	2.9	1.7	4.1	1.5	2.3	1.9	1.0	.6	.3	.9
Poland	2.7	3.2	7.9	13.5	8.2	24.2	3.1	2.1	(a)	.3	2.0	.6
Portugal	.9	.6	.3	.7	.2	.3	.4	.4	2.1	.1	(a)	.3
Romania	.5	.4	1.9	1.6	4.8	21.0	6.6	3.3	1.5	3.3	(a)	0
Spain	10.9	6.1	28.2	5.8	4.3	3.7	4.6	13.5	14.2	6.3	2.1	2.7
Sweden	4.7	9.9	9.1	13.2	10.2	6.7	4.0	11.0	5.5	5.0	2.7	4.1
Switzerland	2.3	4.1	4.1	2.8	3.2	4.3	6.2	12.5	9.2	7.1	5.3	5.3
United Kingdom	19.7	27.7	34.8	38.3	26.6	46.4	83.7	62.9	64.1	59.8	35.0	40.8
U.S.S.R.	30.5	68.1	89.1	48.1	31.4	16.7	7.3	25.8	16.5	1.3	7.5	.6
Yugoslavia	3.2	.9	1.5	2.2	1.6	3.6	3.6	2.1	4.8	1.1	.7	.9
All Other	.3	.2	.5	.2	1.7	.4	.4	1.7	2.3	1.8	1.4	2.0
NORTH AND CENTRAL AMERICA	82.5	103.9	123.7	136.7	109.4	119.8	167.9	304.4	520.5	221.6	108.1	132.5
Canada	57.3	65.0	76.7	78.9	61.1	76.5	95.4	162.4	256.1	82.3	61.7	82.6
Mexico	22.5	34.9	40.3	52.9	42.0	36.9	67.7	135.7	258.9	135.9	42.5	45.7
All Other	2.3	3.0	5.1	4.1	5.1	5.4	4.8	6.3	5.5	3.3	3.8	4.2
SOUTH AMERICA	58.4	50.5	77.9	116.6	73.8	75.3	89.5	64.5	62.1	51.5	18.4	33.6
Argentina	4.2	3.2	4.0	4.3	3.2	10.8	8.0	13.8	7.7	8.2	1.9	3.7
Brazil	43.6	38.2	55.4	86.5	40.5	31.2	23.8	19.2	24.2	21.0	10.9	18.5
Chile	.1	.6	.6	1.3	1.1	1.2	2.3	2.3	2.2	2.0	.3	1.8
Colombia	1.4	.8	2.2	1.3	4.8	3.1	4.1	5.6	4.6	3.4	1.7	3.2
Ecuador	.3	.6	.9	1.5	2.4	2.5	4.0	1.6	3.9	1.3	.4	.5
Peru	1.4	.7	2.0	2.1	1.0	.3	1.7	2.2	3.5	.9	.1	.4
Venezuela	7.0	5.9	12.4	19.2	20.2	25.5	45.2	18.9	15.1	14.3	2.9	5.3
All Other	.4	.5	.4	.4	.6	.7	.4	.9	.9	.3	.1	.2

(Continued)

U.S. EXPORTS OF MACHINE TOOLS

Cutting and Forming by Destination, 1973 to Date

(Millions of Dollars)

(Continued)

Destination	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
ASIA	$67.0	$74.7	$89.8	$79.2	$87.5	$139.3	$151.9	$158.8	$163.6	$141.5	$131.6	$116.1
China	(a)	(a)	(a)	(a)	(a)	6.0	9.3	6.7	1.5	2.4	16.6	13.0
Hong Kong	.6	.4	.6	.7	1.2	2.3	1.6	4.0	10.2	2.5	2.2	3.1
India	2.3	1.9	3.0	2.5	4.2	6.9	4.4	9.7	15.2	15.4	5.4	6.4
Iran	1.1	1.2	6.3	12.1	9.7	21.0	1.9	0	(a)	1.0	(a)	.5
Israel	2.7	3.6	5.8	3.9	3.9	4.1	10.9	12.4	7.7	6.8	7.0	8.2
Japan	40.2	49.1	38.5	27.0	22.1	39.0	48.3	59.1	54.2	51.0	35.7	39.4
Korea, Republic of	5.8	3.6	5.0	5.1	6.8	24.0	34.1	24.3	15.0	11.2	8.8	8.3
Philippines	.6	3.9	6.4	1.8	1.5	1.4	2.6	3.3	3.2	5.2	2.0	1.3
Saudi Arabia	(a)	(a)	(a)	(a)	(a)	9.1	15.2	10.9	14.9	17.3	21.8	12.1
Singapore	2.0	1.9	2.9	3.1	3.9	5.5	6.3	5.5	13.7	14.7	9.3	5.1
Taiwan	4.3	3.7	7.6	9.1	17.1	9.6	10.1	15.3	16.2	8.1	9.2	5.2
Turkey	.7	1.0	2.7	1.0	.6	4.8	1.5	.4	1.4	1.2	3.4	6.7
All Other	3.8	4.4	11.0	12.9	16.5	5.6	5.6	7.2	10.3	4.8	10.2	6.9
OCEANIA	8.1	12.9	21.5	8.3	7.8	13.7	17.0	12.2	22.7	12.7	9.1	7.6
Australia	7.7	12.1	21.0	7.4	6.6	12.8	15.4	10.7	21.6	11.1	8.0	7.3
New Zealand	.5	.9	.5	.8	1.1	.8	1.6	1.4	.7	1.4	1.0	.3
All Other	(a)	(a)	(a)	.1	.1	.1	(a)	.1	.4	.1	.1	(a)
AFRICA	3.6	9.5	12.4	11.6	9.8	10.6	10.2	17.3	26.9	24.0	10.1	9.4
Egypt	(a)	(a)	.1	.4	1.2	1.1	.9	2.5	6.3	3.9	2.2	4.0
South Africa	2.7	7.5	9.1	7.7	4.9	6.4	5.6	11.8	16.9	10.5	5.4	3.8
All Other	.9	2.0	3.2	3.5	3.7	3.2	3.7	3.0	3.7	9.6	2.4	1.6

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. These figures represent exports of domestic merchandise; value at U.S. port. The figures are lower than those for total exports because they include used machines but exclude parts. They are higher than manufacturers' export shipments because the latter are priced f.o.b. factory and exclude export shipments made by other than manufacturers.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS

By Country of Destination, 1973 to Date

(Millions of Dollars)

Destination	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
GRAND TOTAL	$205.5	$264.3	$343.1	$289.6	$257.7	$366.5	$408.0	$495.4	$724.0	$403.5	$258.3	$250.2
EUROPE	80.6	121.7	161.6	115.4	103.7	143.7	144.7	150.0	153.6	112.1	84.4	71.4
Austria	.6	1.3	.2	1.2	1.3	.2	.8	1.4	1.2	1.0	1.9	.1
Belgium	4.1	5.1	5.3	2.8	5.5	5.5	2.2	.8	1.6	2.1	.8	3.3
Denmark	.5	.4	.6	1.9	1.8	.9	1.3	1.3	.5	.8	(a)	.4
Finland	.1	.8	.5	1.3	.1	.6	1.8	1.4	1.3	2.4	.3	.1
France	10.0	5.9	8.5	11.7	5.0	7.5	11.1	10.6	19.1	13.9	5.1	4.1
Germany, West	5.9	9.9	8.3	8.8	13.2	18.1	17.3	22.8	27.3	16.5	17.0	12.7
Greece	(a)	.2	.2	.6	.2	.9	1.4	.6	.3	.7	.1	.2
Ireland	.4	.3	.3	.7	.2	1.4	1.1	2.5	3.0	1.9	1.8	3.1
Italy	6.0	16.5	8.9	5.8	9.1	6.6	11.1	9.7	10.1	6.5	8.7	6.0
Netherlands	1.5	1.8	1.9	1.0	2.5	2.9	3.9	5.0	1.5	1.3	1.2	.7
Norway	.4	.2	2.2	1.5	3.9	1.0	1.8	.9	.7	.4	.1	.7
Poland	2.3	2.9	4.4	4.5	3.9	19.4	2.7	2.1	(a)	.2	1.5	.5
Portugal	.1	.3	.1	.1	.1	.2	.2	.3	1.6	.1	(a)	.1
Romania	.1	.1	.3	1.4	4.8	20.9	1.3	2.3	1.4	1.2	(a)	0
Spain	6.1	2.5	19.1	3.6	2.6	2.0	3.3	3.1	8.2	4.0	1.4	1.1
Sweden	3.0	7.9	7.6	11.6	9.1	5.7	3.2	7.5	3.5	2.2	1.5	3.6
Switzerland	2.0	3.1	3.2	2.3	2.4	3.7	5.3	8.9	7.8	5.4	5.2	2.0
United Kingdom	9.4	17.0	21.0	21.6	13.3	27.2	67.4	42.8	46.7	49.3	29.5	30.6
U.S.S.R.	26.2	44.8	67.6	31.8	23.0	15.5	4.6	23.6	15.1	1.2	7.4	.6
Yugoslavia	1.7	.5	1.1	.8	.7	3.4	2.4	1.1	1.8	.5	.6	.7
All Other	.2	.1	.3	(a)	.6	.3	.4	1.3	.9	.4	.1	.8
NORTH AND CENTRAL AMERICA	45.4	57.4	69.0	74.6	60.6	71.1	108.1	205.1	401.8	137.5	60.8	79.6
Canada	31.4	35.8	45.0	39.6	34.7	44.7	60.4	116.2	208.0	57.6	33.8	45.4
Mexico	12.7	19.5	21.3	33.4	23.5	23.0	44.8	86.2	190.8	78.0	24.6	31.4
All Other	1.1	1.5	2.2	1.5	2.1	2.8	2.9	2.7	3.0	1.9	2.4	2.8
SOUTH AMERICA	38.4	29.3	38.2	47.1	41.9	44.1	37.9	33.0	33.2	33.8	12.1	26.0
Argentina	1.7	2.4	2.6	2.1	2.0	6.6	3.7	6.5	4.3	6.0	1.1	2.0
Brazil	33.4	23.9	29.9	34.9	28.0	25.5	18.5	14.6	14.7	16.2	8.0	17.4
Chile	.1	.2	.4	1.0	.6	.4	.6	.9	1.3	.6	.2	1.6
Colombia	.4	.2	1.0	.3	1.4	1.3	1.4	3.2	2.1	2.5	.9	2.3
Ecuador	.1	.2	.4	.9	.6	1.3	1.3	.7	1.7	.5	.1	.5
Peru	.3	.3	.6	.5	.4	.2	.5	.6	.6	.8	(a)	.3
Venezuela	2.2	2.0	3.2	7.2	8.6	8.6	11.5	5.9	7.9	7.0	1.6	1.8
All Other	.2	.1	.1	.2	.3	.3	.3	.6	.6	.1	.1	.2

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS
By Country of Destination, 1973 to Date

(Millions of Dollars)

(Continued)

Destination	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
ASIA	$35.2	$43.6	$51.5	$42.1	$43.0	$96.5	$100.6	$90.8	$105.9	$100.4	$92.7	$66.4
China	(a)	(a)	(a)	(a)	(a)	4.6	8.8	3.9	1.3	2.0	13.1	10.1
Hong Kong	.5	.3	.3	.5	.5	1.8	1.3	.9	1.8	1.5	1.6	2.3
India	1.8	1.2	2.0	1.9	2.3	4.1	3.4	7.0	10.4	11.7	4.2	2.8
Iran	.7	.5	1.8	1.8	3.3	7.2	.3	0	(a)	.6	(a)	(a)
Israel	1.1	2.1	3.7	2.5	3.1	3.0	6.3	4.3	5.3	4.0	3.0	2.8
Japan	24.4	29.6	23.6	15.6	12.1	30.9	31.1	38.6	40.8	36.6	30.1	23.8
Korea, Rep. of	1.2	1.7	1.8	4.3	5.6	22.1	24.2	16.4	12.7	9.0	6.0	6.7
Philippines	.2	3.2	5.0	1.1	.5	1.0	1.6	1.6	1.9	4.0	1.5	.1
Saudi Arabia	(a)	(a)	(a)	(a)	(a)	3.9	7.4	4.7	8.0	8.3	9.0	2.6
Singapore	1.3	.8	2.0	1.5	2.2	4.6	5.2	3.8	10.4	11.6	6.3	2.3
Taiwan	1.7	2.2	4.2	4.9	5.0	6.1	6.9	6.5	6.5	7.3	7.8	4.2
Turkey	.4	.3	1.4	.5	.5	4.5	1.5	.3	.9	.7	2.6	5.0
All Other	1.9	1.6	5.6	7.5	7.9	2.7	2.5	2.8	5.8	3.2	7.5	3.7
OCEANIA	4.5	7.0	15.4	4.8	3.7	6.3	9.8	5.5	15.9	6.7	4.0	2.2
Australia	4.3	6.7	15.2	4.2	3.2	5.8	8.6	4.9	15.3	6.1	3.2	2.0
New Zealand	.1	.3	.2	.6	.5	.4	1.2	.5	.3	.6	.6	.2
All Other	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	.3	.1	.1	(a)
AFRICA	1.5	5.4	7.4	5.8	4.8	4.8	6.9	10.8	13.5	12.8	4.2	4.5
Egypt	(a)	(a)	.1	.2	.6	.4	.7	1.8	3.2	2.4	.7	2.0
Rep. of South Africa	1.0	4.5	5.6	3.8	3.1	3.4	4.7	7.8	8.5	7.8	2.8	1.5
All Other	.5	.2	1.8	1.8	1.1	.9	1.5	1.2	1.8	2.8	.8	1.1

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. Figures include used machine tools but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS

By Country of Destination, 1973 to Date

(Millions of Dollars)

Destination	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
GRAND TOTAL	$145.1	$179.5	$224.5	$256.7	$194.4	$193.7	$240.8	$290.0	$303.6	$211.5	$147.7	$159.1
EUROPE	50.3	70.6	80.7	78.7	60.1	57.7	67.6	78.1	78.2	51.4	44.3	38.6
Austria	.2	.6	.4	.3	.5	.1	.1	.4	.1	.2	.4	.1
Belgium	1.6	2.7	4.5	2.2	2.3	3.2	1.8	2.9	3.2	.8	.7	1.0
Denmark	.5	.7	.6	.2	.7	.8	1.8	1.7	.8	.6	.3	.5
Finland	.1	.3	.5	.8	.7	(a)	.1	.1	.5	3.9	.8	.3
France	6.4	6.0	7.4	7.2	5.8	4.7	9.3	10.6	10.0	5.3	7.4	7.5
Germany, West	6.3	7.0	5.5	7.2	10.5	11.6	11.1	10.9	7.9	5.3	13.9	8.8
Greece	.4	.7	1.5	.5	.4	.3	3.1	.6	1.1	.9	.3	.1
Ireland	.9	.7	1.8	.7	.8	.6	1.8	1.1	8.5	2.3	2.7	.8
Italy	6.8	6.4	2.7	8.0	4.4	4.4	6.4	3.7	6.7	8.5	6.8	.8
Netherlands	2.6	3.4	2.5	2.6	1.9	1.9	1.5	2.8	5.9	2.0	1.5	1.4
Norway	(a)	.1	.6	.2	.3	.5	.5	1.0	.3	.2	.2	.2
Poland	.3	3	3.5	9.0	4.3	4.8	.4	(a)	0	(a)	.5	.1
Portugal	.8	.3	.2	.6	(a)	.2	.2	.2	.5	(a)	(a)	.2
Romania	.4	.3	1.6	.2	(a)	.1	5.3	1.0	.1	2.1	0	0
Spain	4.9	3.6	9.0	2.2	1.7	1.8	1.3	10.4	6.0	2.3	.6	1.4
Sweden	1.6	2.0	1.5	1.5	1.1	1.1	.8	3.4	2.0	2.9	1.1	.6
Switzerland	.3	1.0	.9	.5	.8	.6	.9	3.6	1.4	1.7	.2	3.3
United Kingdom	10.2	10.7	13.8	16.7	13.4	19.2	16.3	20.2	17.3	10.5	5.6	10.2
U.S.S.R.	4.4	23.3	21.4	16.3	8.4	1.2	2.7	2.2	1.4	.1	(a)	.1
Yugoslavia	1.5	.4	.4	1.5	.9	.1	1.3	1.0	3.1	.6	(a)	.2
All Other	.1	0	.2	.2	1.1	.3	1.0	.1	1.4	1.5	1.3	1.2
NORTH AND CENTRAL AMERICA	37.1	46.6	54.7	62.1	48.8	48.7	59.8	99.4	118.8	84.1	47.3	52.9
Canada	26.0	29.2	31.6	39.3	26.4	31.8	34.9	46.2	48.2	24.7	28.0	37.2
Mexico	9.8	15.4	19.1	19.5	18.5	13.9	22.9	49.5	68.1	57.9	17.9	14.4
All Other	1.2	1.5	2.9	2.6	3.0	2.6	2.0	3.7	2.5	1.5	1.4	1.4
SOUTH AMERICA	20.0	21.1	39.7	69.5	31.9	31.2	51.7	31.6	28.8	17.7	6.3	7.6
Argentina	2.5	.8	1.4	2.2	1.2	4.3	4.3	7.3	3.4	2.2	.8	1.7
Brazil	10.2	14.3	25.4	51.6	12.5	5.7	5.3	4.7	9.5	4.8	3.0	1.1
Chile	(a)	.4	.2	.3	.5	.8	1.7	1.4	.9	1.4	(a)	.2
Colombia	1.0	.6	1.2	1.0	3.4	1.8	2.6	2.4	2.5	.9	.8	.9
Ecuador	.2	.4	.5	.6	1.9	1.2	2.6	.9	2.2	.8	.3	.1
Peru	1.0	.4	1.5	1.6	.6	.1	1.2	1.6	2.9	.1	.1	.1
Venezuela	4.8	3.9	9.2	12.0	11.6	16.9	33.7	13.0	7.2	7.3	1.3	3.5
All Other	.2	.3	.3	.2	.2	.4	.3	.3	.2	.2	(a)	.1

(Continued)

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS
By Country of Destination, 1973 to Date

(Millions of Dollars)

(Continued)

Destination	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
ASIA	$31.9	$33.1	$38.3	$37.0	$44.5	$42.8	$51.2	$67.9	$57.7	$41.1	$38.9	$49.6
China	(a)	(a)	(a)	(a)	(a)	1.4	.5	2.8	.2	.4	3.6	2.8
Hong Kong	.1	.2	.2	.2	.7	.5	.3	3.0	8.4	1.0	.6	.8
India	.5	.7	.9	.5	1.9	2.8	1.0	2.7	4.5	3.7	1.1	3.6
Iran	.4	.7	4.5	10.3	6.4	13.7	1.6	0	(a)	.4	0	.5
Israel	1.5	1.5	2.0	1.4	.7	1.1	4.6	8.1	2.4	2.8	4.0	5.4
Japan	15.8	19.5	15.0	11.4	9.9	8.1	17.1	20.5	13.4	14.4	5.6	15.6
Korea, Rep. of	7.6	1.9	3.2	.8	1.3	2.0	9.9	7.9	2.3	2.3	2.8	1.6
Philippines	.5	.7	1.4	.7	1.0	.4	1.0	1.7	1.3	1.2	.6	1.1
Saudi Arabia	(a)	(a)	(a)	(a)	(a)	5.2	7.8	6.3	6.9	9.0	12.8	9.4
Singapore	.7	1.1	.9	1.6	1.7	.8	1.1	1.6	3.3	3.1	2.9	2.8
Taiwan	2.6	1.4	3.4	4.2	12.1	3.5	3.2	8.8	9.7	.6	1.4	.9
Turkey	.2	.7	1.3	.5	.1	.4	(a)	.1	.5	.5	.8	1.7
All Other	2.0	2.6	13.2	5.4	8.7	2.9	3.1	4.4	4.4	1.6	2.8	3.2
OCEANIA	3.6	5.9	6.1	3.6	4.1	7.5	7.2	6.7	6.7	5.9	5.1	5.5
Australia	3.3	5.4	5.7	3.3	3.4	7.1	6.8	5.8	6.2	5.0	4.7	5.3
New Zealand	.3	.5	.4	.2	.5	.3	.4	.8	.4	.9	.4	.1
All Other	(a)	(a)	(a)	.1	.1	.1	(a)	(a)	.1	.1	0	(a)
AFRICA	2.1	4.2	5.0	5.8	5.0	5.8	3.3	6.3	13.4	11.2	5.8	4.9
Egypt	(a)	(a)	.1	.2	.6	.6	.2	.8	3.1	1.5	1.5	2.1
Rep. of South Africa	1.7	3.0	3.5	3.9	1.8	2.9	.9	4.0	8.3	2.7	2.7	2.3
All Other	.4	1.2	1.4	1.7	2.6	2.3	2.2	1.6	2.0	7.0	1.7	.5

(a) Less than $50,000 and/or included in "All Other."

Note: Individual items may not add to totals due to rounding. Figures include used machine tools for all years but exclude parts.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS
By Machine Classification, 1973 to 1982
(Millions of Dollars)

Machine Classification	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
GRAND TOTAL	$248.8	$320.7	$417.2	$362.7	$321.4	$453.7	$544.9	$674.6	$974.2	$630.5
Complete New Machines	194.6	245.5	327.9	273.8	247.2	353.0	392.5	462.8	668.6	375.6
Machining Centers, N.C.										
Vertical, A.T.C.	(a)	18.4	27.4	35.5	35.9	13.1	14.1	9.3	11.4	6.1
Horizontal, A.T.C.						18.2	28.5	24.3	27.0	19.1
Manual Tool Change						2.2	2.8	23.2	15.0	6.8
Vertical Boring-Drilling-Milling	(a)	(a)	(a)	(a)	(a)	.9	.9	8.2	42.1	4.6
Horizontal Boring-Drilling-Milling	5.8	8.5	8.4	5.8	11.4	9.1	14.4	5.8	12.9	8.9
Vertical Boring and Turning Mills (incl. Vertical Turret Lathes)	2.5	3.3	7.7	8.1	6.6	6.6	10.6	13.6	18.7	14.5
Boring-Drilling-Milling, N.E.C.	1.9	2.4	3.7	2.4	2.2	5.0	6.5	5.5	5.7	4.4
Drilling, Vertical (Upright)	2.4	2.8	6.4	4.9	4.6	2.5	2.0	1.4	2.9	.8
Multiple Spindle	2.4	1.7	1.8	1.3	1.6	3.3	3.6	11.5	7.8	3.6
Radial	.5	.9	.9	1.6	1.1	1.6	1.3	1.9	2.0	1.3
Other	7.3	7.5	4.7	5.8	7.4	6.4	9.9	7.5	11.7	6.7
Gear Hobbers and Shapers (b)	.7	.8	1.8	1.6	.4	1.3	2.1	8.8	22.7	5.3
Gear Tooth Grinding & Finishing	8.0	6.5	5.9	7.9	3.8	12.8	4.4	14.0	18.1	9.2
Other Gear Cutting (g)	18.9	21.9	23.7	16.2	23.9	32.9	37.3	38.4	39.3	22.7
External Cylindrical Grinding	8.4	10.8	9.6	11.1	3.7	34.0	13.2	9.3	15.9	7.2
Surface Grinding	7.0	6.8	8.6	10.8	8.3	8.8	11.4	16.8	26.2	17.4
Tool and Cutter Grinding	7.4	7.5	7.9	7.1	7.3	6.8	5.7	9.2	9.5	6.5
Polishing and Buffing	2.6	1.7	1.3	1.0	.9	2.7	2.9	5.2	11.2	8.1
Honing and Lapping	5.1	3.4	4.1	7.0	3.3	4.3	3.8	3.9	9.5	3.3
Internal Cylindrical Grinding	6.5	9.6	6.3	6.9	3.7	4.9	5.9	7.8	5.1	4.3
Other Grinding and Polishing (c)	13.5	13.3	15.2	13.4	12.9	19.3	23.1	32.7	49.0	24.3
Engine Lathes	5.2	3.8	6.8	6.1	4.3	8.3	6.1	3.0	5.6	2.4
Turret Lathes (Excl. Vertical)	2.3	4.5	4.6	9.4	6.7	7.1	7.0	(f)	(f)	(f)
Automatic Chucking Lathes										
Single Spindle	3.8	2.8	5.9	7.6	4.2	7.7	12.4	5.6	7.5	2.3
Multiple Spindle	1.8	5.3	2.8	2.8	4.6	3.4	4.9	3.6	4.3	2.3
Automatic Screw Machines	3.9	6.0	7.4	6.2	5.7	5.2	6.3	9.8	10.9	4.6
Other Lathes	7.3	8.6	12.1	15.3	16.8	11.9	16.3	45.1	61.8	58.8
Milling Machines										
Knee Type	3.1	4.6	4.7	3.2	4.5	4.0	3.4	1.1	.5	.8
Bed Type	.5	1.6	1.8	1.7	2.9	11.9	2.8	2.8	2.0	.3
Profile, Dup. & Die Sinking	2.3	2.9	2.9	3.4	1.0	5.5	4.9	2.9	5.5	1.6
Other	8.1	5.7	11.2	6.0	12.9	9.1	12.3	12.4	29.8	19.6
Broaching	2.5	3.2	5.5	1.8	3.4	11.6	2.4	6.9	15.5	13.3
Planers, Other than Gear	.4	.3	.5	.6	.7	1.5	1.6	(a)	(a)	(a)
Shapers and Slotters	.3	1.3	.5	1.0	.6					
Sawing and Cutoff	5.1	6.1	9.0	8.5	7.0	13.5	12.5	12.2	12.6	8.8
Tapping	1.3	1.0	1.4	3.4	1.6	1.9	1.9	(a)	(a)	(a)
Threading	4.0	4.9	3.0	2.5	4.5	4.2	9.9	(a)	(a)	(a)
Electrical Discharge	(a)	(a)	(a)	(a)	(a)	3.4	5.2	10.2	5.2	3.2
Single Station (Way Type)						.3	.4	51.7	97.2	36.4
Multi-Station	30.9	39.2	72.0	25.1	7.7	16.0	42.9			
Metal Cutting Machine Tools, N.E.C.										
$2,500 and Over, New (d)	11.2	9.8	17.3	11.9	10.8	11.7	14.5	21.1	27.1	20.1
Less than $2,500, New (e)		6.5	9.0	8.9	3.3	17.9	20.5	15.9	19.0	13.7
Used and Rebuilt Machines	10.9	18.8	15.2	16.0	10.5	13.5	15.5	32.6	50.4	27.9
Parts	43.3	56.4	74.1	72.9	63.7	87.3	136.9	179.2	250.2	226.9

N.E.C. • Not Elsewhere Classified.

(a) Included in "Metal Cutting Machine Tools, N.E.C."
(b) "Gear Hobbers" for years prior to 1978.
(c) "Other Grinding" for years prior to 1978.
(d) "$1,000 and Over" for years prior to 1978.
(e) "Less than $1,000" for years prior to 1978.
(f) Included in "Other Lathes."
(g) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: Individual items may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1973 to 1982

(Millions of Dollars)

Machine Classification	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
GRAND TOTAL	$194.3	$245.7	$288.6	$320.0	$258.1	$284.9	$333.7	$424.6	$471.4	$371.9
Complete New Machines	130.9	165.1	208.7	241.1	179.5	180.1	226.6	271.4	281.0	198.9
Punching and Shearing Machines	5.0	9.4	13.8	20.2	15.4	13.7	22.3	44.8	44.9	32.9
Bending and Forming Machines	16.3	21.3	22.9	26.0	25.5	39.2	45.7	41.0	46.0	35.1
Hydraulic and Pneumatic Presses	26.1	27.5	37.5	46.8	29.1	21.5	32.6	42.0	56.4	29.9
Mechanical Presses, O.B.I.	15.6(a)	31.1(a)	28.5(a)	33.2(a)	17.5(a)	2.2	1.1	27.7	22.9	23.9
Other Mechanical Presses						8.6	18.1			
Headers and Upsetters	9.2	8.2	8.7	10.6	9.2	14.8	13.2	4.4	7.7	7.2
Forging Machines (except Presses)	4.5	2.7	3.8	3.0	4.2	6.2	7.0	12.0	13.6	8.1
Metal Container-making Machines	11.5	16.7	17.0	23.6	12.0	22.8	32.9	(d)	(d)	(d)
Metal Forming Machines, N.E.C.	5.6	6.1	9.3	6.5	8.1	44.7	46.5	92.4(e)	83.1(e)	57.6(e)
Metalworking Machines, N.E.C.	37.1	39.2	63.6	67.0	54.2					
Metal Forming Mach. Tools under $2,500 (b)	(a)	2.9	3.6	4.2	4.3	6.4	7.2	7.1	6.1	4.2
Used and Rebuilt Machines	14.1	14.5	15.8	15.6	14.9	13.6	14.2	18.6	22.6	12.5
Parts (c)	49.2	66.3	64.1	63.3	63.7	91.2	92.9	134.7	167.8	160.5

N.E.C. - Not Elsewhere Classified.

(a) Included in the respective metal forming and metalworking classifications for years prior to 1974.
(b) Under $1,000 for years prior to 1978.
(c) Chucks, chuckholders, tool holders and their parts and work holding, positioning equipment and other attachments and accessories are not included after 1971.
(d) Included in "Metal Forming Machines, N.E.C."
(e) From 1980 forward "Die Casting Machines & Parts" are included.

Sources: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1983 and 1984

(Values in Thousands of Dollars)

Machine Classification	1983		1984	
	Units	Value	Units	Value
GRAND TOTAL	41,292	$430.774(a)	43.339	$445,975(a)
Complete New Machines	38.219	$230,624	40,648	$223,490
Gear Hobbers and Shapers	25	1,585	25	2,989
Gear Cutting Machines, N.E.C.	15	6,954	34	9,020
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel 26" or Less	22	2,544	37	2,880
Vertical Mach. Ctrs. ATC, NC, Y-Axis Travel Over 26"	3	728	2	323
Horizontal Machining Centers, ATC, NC	15	4,233	38	10,482
Machining Centers, NC, N.E.C.	62	5,844	40	4,894
Single Station and Multi-Station Transfer Machines	19	20,531	9	4,119
Way Type Machines (Unit Heads)	8	597	6	1,074
Horiz. Boring-Drilling-Milling Machines, Table Type, NC	7	2,727	8	1,746
Horiz. Boring-Drilling-Milling Machines, NC, N.E.C.	1	116	7	1,630
Vertical Boring-Drilling-Milling Machines, NC	8	1,424	13	2,701
Horiz. Boring-Drilling-Milling Machines, non-NC	1	28	12	1,155
Vertical Boring-Drilling-Milling Machines, non-NC	91	4,662	106	2,071
Drilling Machines, NC	6	1,227	7	1,446
Drilling Machines, Multi-Spindle, non-NC	12	701	38	4,887
Drilling Machines, Radial, non-NC	56	1,202	9	203
Drilling Machines, Upright, Single Spindle, non-NC	25	2,472	10	84
Drilling Machines, non-NC, N.E.C.	134	2,723	158	3,694
Milling Machines, NC	15	5,036	57	17,770
Milling Machines, Profiling, Dupl. & Die Sinking, non-NC	30	1,466	21	325
Milling Machines, Knee Type, non-NC	19	1,473	5	159
Milling Machines, Bed Type, non-NC	5	145	4	332
Milling Machines, non-NC, N.E.C.	118	5,773	122	4,084
Vertical Boring Machines, incl. VTL's, NC	12	2,337	10	2,145
Vertical Boring Machines, incl. VTL's, non-NC	23	3322	56	3,779
Boring Machines, NC, N.E.C.	3	784	3	151
Boring Machines, non-NC, N.E.C.	47	3,123	51	2,268
Horizontal Lathes, NC, Less Than 25 HP	101	8,456	96	7,276
Horizontal Lathes, NC, 25-50 HP	24	3,870	9	1,007
Horizontal Lathes, NC, Over 50 HP	7	1,366	9	2,179
Horizontal Engine & Toolroom Lathes, non-NC	131	3,514	124	2,655
Automatic Chucking Lathes, Single Spindle, non-NC	24	2,722	15	2,981
Automatic Chucking Lathes, Multi-Spindle, non-NC	4	973	40	4,778
Automatic Bar Machines, Single Spindle, non-NC	30	1,659	24	736
Automatic Bar Machines, Multi-Spindle, non-NC	30	1,585	45	3,789
Horizontal Lathes, non-NC, N.E.C.	206	4,168	306	3,785
Vertical Lathes, excl. VTL's, NC	6	1,295	16	2,547
Vertical Lathes, excl. VTL's, non-NC	124	5,323	220	7,692
Grinding, Polishing, Honing & Lapping Machines, NC	53	12,316	66	7,433
Gear Tooth Grinding & Finishing Machines, non-NC	25	3,303	25	5,262
Tool & Cutter Grinding Machines, non-NC	112	5,086	125	2,814
Honing & Lapping Machines, non-NC	144	2,903	197	2,444
Grinding Machines, Flat Surface Reciprocating Table, non-NC	59	1,397	73	2,254
Grinding Machines, Flat Surface, non-NC, N.E.C.	169	11,180	136	7,561
External Grinding Machines, non-NC	33	3,869	27	3,854
Internal Grinding Machines, non-NC	8	1,422	15	1,726
Grinding, Polishing & Buffing Machines, non-NC, N.E.C.	101	3,554	128	10,059
Grinding Machines, non-NC, N.E.C.	251	7,274	232	8,531

Footnotes are at the end of the Table.

(Continued)

U.S. EXPORTS OF METAL CUTTING MACHINE TOOLS AND PARTS

By Machine Classification, 1983 and 1984

(Values in Thousands of Dollars)

(Continued)

Machine Classification	1983		1984	
	Units	Value	Units	Value
Traveling Wire Electrical Discharge Machines	69	$ 4,643	20	$ 791
All Other Electrical Discharge Machines	60	1,171	80	2,786
Spark Erosion, Ultrasonic & Electrolytic Machines, NC	7	288	1	82
Spark Erosion, Ultrasonic & Electrolytic Machines, non-NC	55	1,035	110	2,417
Metal Cutting Machine Tools, NC, N.E.C.	12	805	43	3,646
Sawing & Cut-off Machines, non-NC	402	9,073	469	9,560
Broaching Machines, non-NC	10	1,442	14	1,111
Metal Cutting Machine Tools, non-NC, N.E.C.	242	11,087	338	15,737
Metal Cutting Machine Tools, Less Than $2,500	34,777	10,270	36,757	9,515
Metal Cutting Machine Tools, Used or Rebuilt	3,073	27,679	2,691	26,730
Parts	—	172,471	—	195,755

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. EXPORTS OF METAL FORMING MACHINE TOOLS AND PARTS

By Machine Classification, 1983 and 1984

(Values in Thousands of Dollars)

Machine Classification	1983		1984	
	Units	Value	Units	Value
GRAND TOTAL	9,750	$261,090(a)	7,490	$288,955(a)
Complete New Machines	8,705	$128,413	6,987	$149,967
Die Casting Machines & Parts	—	10,314	—	12,261
Metal Forming Machine Tools, Less Than $2,500	6,493	3,695	4,277	2,891
Punching & Shearing Machines, incl. Combination, NC	23	2,615	49	8,510
Shearing Machines, non-NC	79	2,264	99	1,895
Punching & Combination Punching & Shearing Mach., non-NC	473	13,176	421	12,193
Bending, Folding, Straightening & Flattening Machines, NC	105	7,135	100	4,035
Press Brakes, non-NC	25	1,293	31	738
Bending Rolls, Ram & Press Bending Machines, non-NC	18	784	16	520
Bending, Folding, Str. & Flattening Machines, non-NC, N.E.C.	309	10,438	439	14,121
Mechanical Presses, non-NC	113	10,355	280	19,309
Hydraulic Presses, Vertical, Single Action, non-NC	50	3,764	19	2,638
Hydraulic & Pneumatic Presses, non-NC, N.E.C.	270	15,843	373	14,088
Headers & Upsetters, non-NC	25	3,732	47	7,526
Forging Machines, non-NC, N.E.C.	107	4,199	93	4,246
Metal Forming Machine Tools, non-NC, N.E.C.	615	38,770	743	44,954
Metal Forming Machine Tools, Used or Rebuilt	1,045	19,247	503	9,110
Parts	—	113,430	—	129,878

N.E.C. - Not Elsewhere Classified.

(a) The data may not add to totals due to rounding.

Source: U.S. Bureau of the Census, "EM 522."

U.S. FOREIGN TRADE IN MACHINE TOOLS AND PARTS

1958 to Date

(Millions of Dollars)

	Exports of Domestic Merchandise (Value at U.S. Port)			Imports for Consumption (Value in Foreign Country)		
Year	TOTAL	Metal Cutting	Metal Forming	TOTAL	Metal Cutting	Metal Forming
1958	$ 148.8	$100.5	$ 48.3	$ 28.1	$ 17.6	$ 10.5
1959	135.0	82.2	52.8	32.5	23.8	8.7
1960	192.5	127.8	64.7	35.7	26.3	9.4
1961	270.2	191.6	78.6	32.4	22.6	9.8
1962	303.9	205.3	98.6	37.5	28.4	9.1
1963	220.6	144.9	75.7	45.1	33.4	11.7
1964	300.8	204.8	96.0	45.6	38.1	7.5
1965	287.2	191.6	95.6	68.9	58.9	10.0
1966	273.6	176.3	97.3	137.4	121.2	16.2
1967	294.5	199.6	94.9	203.7	174.8	28.9
1968	286.0	178.2	107.8	191.3	166.1	25.2
1969	323.5	201.1	122.4	182.6	153.4	29.2
1970	403.9	268.8	135.1	158.5	126.1	32.4
1971	351.0	210.3	140.7	109.6	87.4	22.2
1972	332.1	186.7	145.4	141.8	104.2	37.6
1973	443.0	248.7	194.3	211.6	164.6	47.0
1974	566.5	320.8	245.7	330.3	261.3	69.0
1975	705.9	417.3	288.6	382.4	303.0	79.4
1976	682.7	362.7	320.0	383.3	293.6	89.7
1977	579.5	321.4	258.1	482.2	386.7	95.5
1978	738.6	453.7	284.9	832.4	681.6	150.7
1979	878.6	544.9	333.7	1,269.5	1,027.6	241.9
1980	1,099.2	674.6	424.6	1,556.9	1,282.2	274.7
1981	1,445.6	974.2	471.4	1,712.9	1,485.1	227.8
1982	1,002.4	630.5	371.9	1,489.4	1,258.1	231.3
1983	691.9	430.8	261.1	1,100.2	836.9	263.3
1984	734.9	446.0	289.0	1,652.7	1,316.5	336.1

Note: Machine tool export figures include used and rebuilt machine tools, machine tools designed for home workshops and laboratories, and some metalworking machinery other than machine tools. Some attachments and accessories are included prior to 1972.

Sources: U.S. Bureau of the Census, "EM 522" and "IM 146."

The coverage of exports reported by the Bureau of the Census in its report "EM 522" is more inclusive than that reported as "manufacturers' export shipments." The data include exports by distributors and brokers, rebuilt tools, machine tools designed for workshops, garages, etc. Values include freight, insurance, and other charges from the manufacturers' plants to the point of departure in the United States. Import values exclude import duties, insurance, ocean freight and other charges incidental to the arrival of goods in the United States.

U.S. FOREIGN TRADE IN BORING MACHINES INCLUDING VERTICAL TURRET LATHES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1965	776	$11.9	174	$ 4.8	394	$ 6.1
1966	484	12.1	183	5.3	692	12.8
1967	435	13.0	177	4.8	937	21.0
1968	383	14.4	147	4.4	1,057	19.4
1969	363	11.7	121	6.2	797	21.0
1970	503	18.6	158	8.1	2,223	22.8
1971	419	11.5	139	3.8	808	11.6
1972	392	11.2	71	3.0	1,083	13.6
1973	427	10.2	NA	3.7	825	14.4
1974	328	14.1	NA	12.0	1,726	28.8
1975	566	19.7	NA	8.1	2,521	41.1
1976	393	16.3	NA	9.8E	3,219	41.0
1977	382	20.3	NA	6.5	4,824	51.7
1978	577	21.7	NA	10.2	1,347	65.9
1979	724	32.4	NA	9.5	1,901	70.7
1980	626	33.2	NA	17.7	2,289	76.9
1981	797	79.4	NA	41.5E	3,158	86.7
1982	303	32.4	NA	14.9	3,140	78.8
1983	193	18.5	NA	D	1,327	44.6
1984	266	17.6	NA	D	844	49.7

NA - Not Available. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

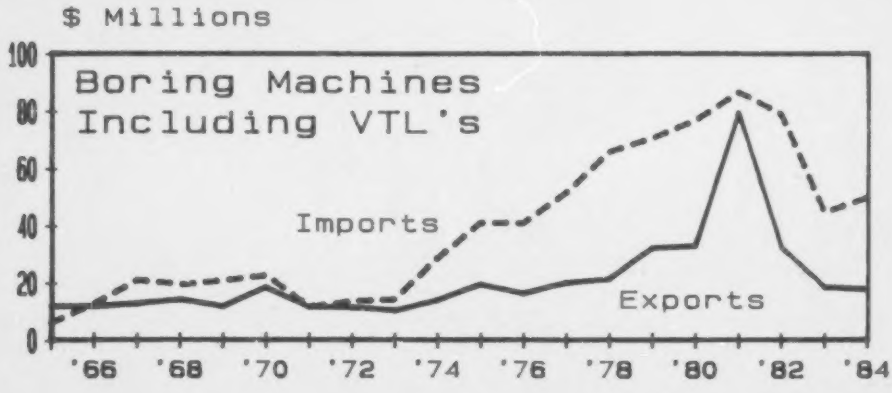
(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Manufacturers' export shipments exclude vertical turret lathes.

(c) Generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

The user should be aware that the minimum valuation of machine included in each of the three series shown on this and following tables has changed over time. "Total Exports" included all machines, regardless of value, until 1973. From 1974 through 1977 the series included only machines above $1,000. The minimum value was increased in 1978 to $2,500. "Manufacturers' Export Shipments" include machines valued less than $1,000 for all years shown. "Imports for Consumption" included all machines regardless of value through 1977. After 1977 only machines valued over $2,500 are included.



U.S. FOREIGN TRADE IN DRILLING MACHINES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1965	7,315	$ 8.6	612	$ 4.2	1,864	$ 2.3
1966	3,425	6.1	494	4.6	3,732	5.1
1967	3,427	10.9	685	7.2	5,304	7.6
1968	1,811	6.8	724	4.7	5,403	10.1
1969	2,413	9.5	1,153	5.6	6,146	6.0
1970	2,316	9.5	1,353	5.5	5,690	4.3
1971	2,173	8.5	672	5.0	4,744	2.9
1972	1,788	9.5	587	4.4	8,223	4.3
1973	2,889	12.6	NA	6.0E	8,541	.6
1974	883	12.9	NA	6.2	11,928	8.8
1975	860	13.9	NA	9.3	11,754	9.4
1976	815	13.6	NA	7.8	50,147(c)	15.3(c)
1977	782	14.6	NA	4.2	72,534(d)	19.7(d)
1978	688	13.8	NA	4.1	1,714	18.7
1979	1,762	16.8	NA	4.2	2,515	25.0
1980	546	22.2	NA	12.2	2,253	27.2
1981	566	24.4	NA	12.1	2,238	26.4
1982(r)	349	12.4	NA	3.4	1,317	20.7
1983(r)	233	8.3	NA	5.1	585	9.9
1984(p)	222	10.3	NA	1.2	916	17.9

NA - Not Available.   E - Estimate by NMTBA.   p - Preliminary.   r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

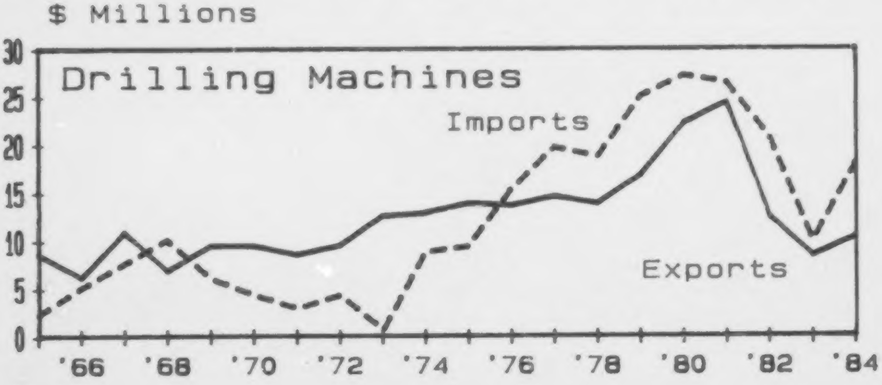
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 6,000 and dollar value about $12,000.

(d) The average unit value of imports from Norway, India, Japan and Taiwan, as reported by the U.S. Bureau of the Census, was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufactures' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GEAR CUTTING AND FINISHING MACHINES
1965 to Date
(Values in Millions of Dollars)

Year	Exports of Domestic Merchandise: Total Exports: Units	Exports of Domestic Merchandise: Total Exports: Value at U.S. Port	Exports of Domestic Merchandise: Manufacturers' Export Shipments (a): Units	Exports of Domestic Merchandise: Manufacturers' Export Shipments (a): Value F.O.B. Factory	Imports for Consumption: Units	Imports for Consumption: Customs Import Value (b)
1965	681	$16.1	509	$18.6	227	$ 3.3
1966	632	15.8	471	18.0	281	2.4
1967	852	23.6	692	29.4	279	3.6
1968	1,266	26.6	647	30.8	297	3.8
1969	841	24.4	615	32.2	320	2.5
1970	780	28.4	636	40.0	226	4.5
1971	1,030	30.0	588	36.4	132	3.7
1972	900	30.0	439	30.7	250	4.5
1973	718	27.5	NA	29.0E	134	4.7
1974	546	29.1	NA	40.0E	343	10.7
1975	499	31.4	NA	35.9	365	20.7
1976	552	25.7	NA	19.7E	198	16.9
1977	303	28.1	NA	D	200	13.5
1978	1,069(c)	47.0(c)	NA	D	494(d)	25.9(d)
1979	684(e)	43.8(e)	NA	D	466	33.1
1980	519(e)	61.2(e)	NA	D	415	41.3
1981	698(e)	80.1(e)	NA	D	367	37.0
1982	369(e)	37.4(e)	NA	D	281	25.8
1983	65	11.8	NA	D	153	13.8
1984	84	17.3	NA	D	328	18.1

NA - Not Available. E - Estimate. D - Withheld to avoid disclosure.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

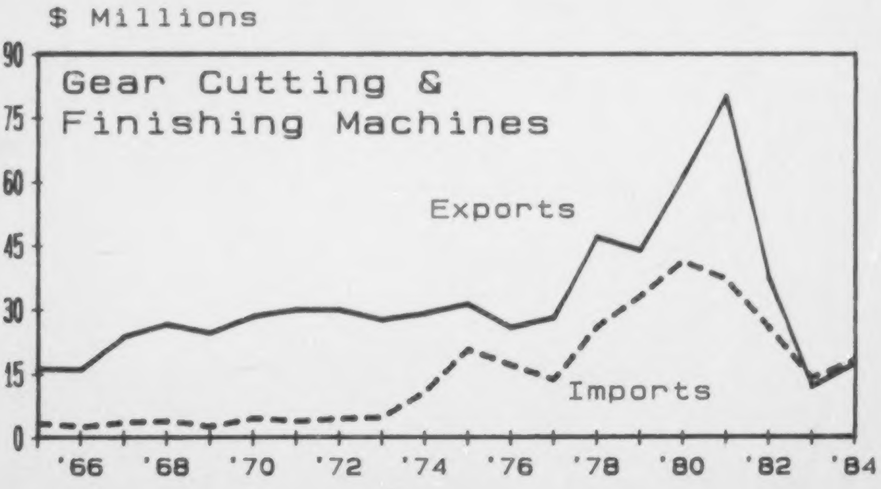
(c) Includes machines valued at less than $2,500.

(d) Includes used, rebuilt and machines valued less than $2,500 each.

(e) Data for years 1979 to 1982 may be inaccurate due to a reporting error by exporters.

Note: See note page 147 concerning description of categories.

Sources: Manufacturers export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN GRINDING AND POLISHING MACHINES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1965	8,607	$ 37.4	3,575	$31.1	2.817	$ 6.5
1966	7,093	34.6	4,779	30.4	4,966	12.7
1967	7,128	32.0	4,155	29.7	4,934	16.0
1968	7,679	28.9	3,354	27.7	5,792	17.0
1969	7,906	41.5	3,396	37.0	5,352	16.6
1970	9,154	48.4	4,190	47.0	5,425	15.3
1971	8,094	32.7	3,677	29.4	3,175	11.6
1972	8,900	30.2	3,591	26.8	4,791	12.7
1973	9,883	50.5	NA	39.4	3,972	20.0
1974	3,266	53.0	NA	53.5	7,500	32.4
1975	3,022	53.0	NA	49.5	5,641	34.1
1976	2,537	57.3	NA	56.3	35,411(c)	32.2(c)
1977	4,124	40.1	NA	38.3	46,573(d)	39.2
1978	2,455	80.8	NA	49.8	3,261	68.1
1979	2,487	65.9	NA	42.0	4,233	80.5
1980	1,979	85.1	NA	75.4	5,698	138.6
1981	2,694	126.5	NA	88.2	5,334	137.2
1982(r)	1,877	71.1	NA	69.3	4,530	117.6
1983(r)	930	49.0	NA	54.2	3,282	89.6
1984(p)	999	46.7	NA	34.1	5,249	118.5

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

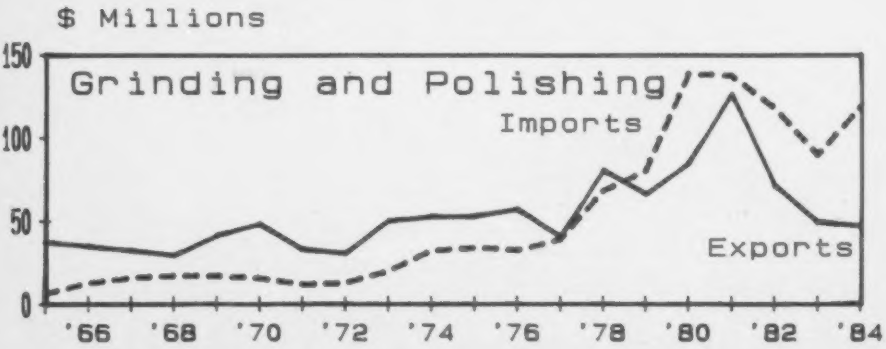
(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Estimated imports from Taiwan and Japan evidently include bench type, home workshop and possibly portable machines which are not by traditional definition machine tools. Estimates by NMTBA indicate actual units may have been as low as 11,500 and the dollar value about $31 milion.

(d) The average unit value of imports from Taiwan, as reported by the U.S. Bureau of the Census was extremely low. Evidently these imports include machines which are not by traditional definition machine tools.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census. "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN LATHES, EXCLUDING VERTICAL TURRET LATHES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a,b)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (c)
1965	4,072	$23.5	1,322	$20.1	8,736	$ 14.2
1966	2,740	19.8	1,131	18.6	14,819	37.2
1967	2,611	21.6	1,083	18.7	15,654	47.7
1968	2,161	18.8	683	15.3	11,452	38.1
1969	2,213	22.2	673	16.8	13,241	38.0
1970	2,871	29.2	842	29.3	12,082	27.9
1971	2,481	26.8	774	24.0	6,252	17.8
1972	2,957	21.1	500	19.2	5,578	22.9
1973	3,124	24.3	NA	20.3E	6,058	45.7
1974	1,921	31.0	NA	31.9E	8,187	73.1
1975	2,503	43.6	NA	55.0	6,745	77.0
1976	2,153	47.4	NA	45.9	7,801	77.0
1977	1,953	42.3	NA	35.6	11,527	113.0
1978	1,434	43.7	NA	37.1	12,280	219.3
1979	1,717	53.0	NA	45.5(d)	18,332	353.6
1980	1,107	67.1	NA	50.8(d)	16,710	380.0
1981	1,468	90.0	NA	58.5(d)	15,445	479.8
1982	957	70.4	NA	36.8	11,141	338.6
1983	687	34.9	NA	D	6,662	165.7
1984	904	39.4	NA	D	9,019	268.1

NA - Not Available. E - Estimate by NMTBA. D - Withheld to avoid disclosure.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

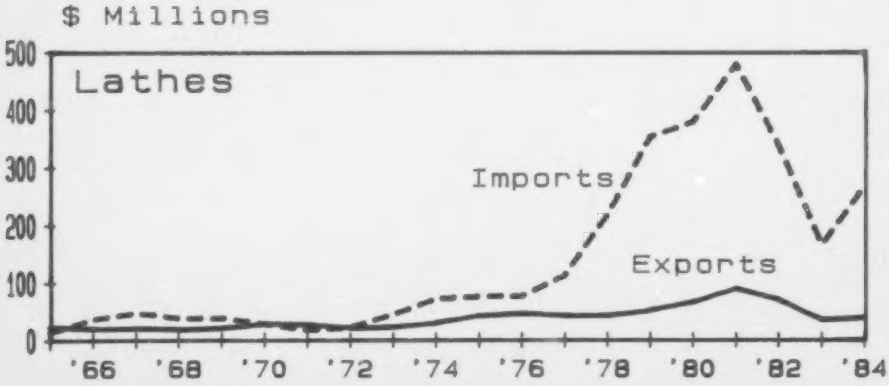
(b) Manufacturers' export shipments include vertical turret lathes.

(c) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(d) Does not include data for Vertical NC Lathes.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MILLING MACHINES

1965 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1965	988	$ 7.5	398	$ 8.8	1,128	$ 6.1
1966	1,072	8.9	338	10.2	3,405	17.4
1967	802	11.3	399	16.8	5,715	31.4
1968	848	17.9	304	12.1	5,428	30.6
1969	686	13.6	368	6.7	4,710	26.3
1970	779	19.1	456	12.2	2,047	13.4
1971	681	17.6	276	11.8	986	7.9
1972	589	13.6	416	5.3	1,441	7.5
1973	687	14.0	NA	8.0E	1,760	12.4
1974	776	14.8	NA	10.3	2,313	19.8
1975	804	20.6	NA	20.6	2,567	23.3
1976	799	14.4	NA	16.3E	2,413	25.9
1977	965	21.3	NA	D	3,720	27.9
1978	1,026	30.6	NA	D	3,364	47.7
1979	1,040	23.4	NA	20.1	6,650	83.1
1980	360	19.2	NA	27.9	11,573	138.1
1981	292	37.8	NA	33.4	10,434	124.7
1982	331	22.4	NA	21.0	5,985	87.7
1983 (r)	187	13.9	NA	9.0	3,660	52.5
1984 (p)	209	22.7	NA	16.1	6,471	83.4

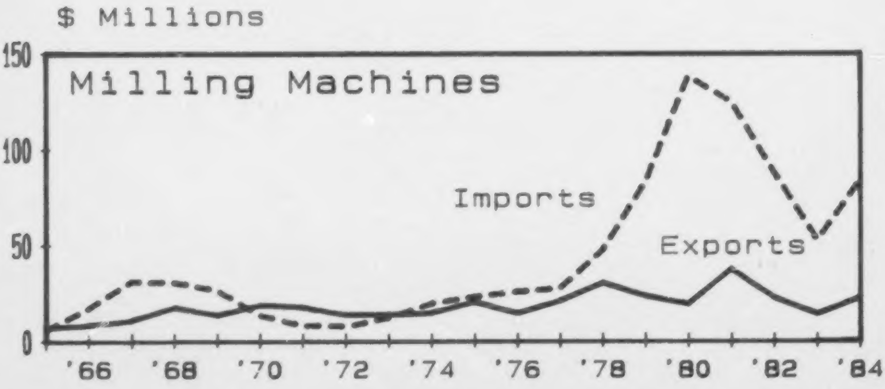
NA - Not Available. D - Withheld to avoid disclosure. E - Estimate by NMTBA. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. FOREIGN TRADE IN MACHINING CENTERS

1979 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1979(c)	259	$45.4	NA	D	552	$ 39.6
1980	313	56.7	NA	$57.9	957	93.4
1981	316	53.4	NA	43.0	2,007	195.7
1982	195	34.0	NA	D	1,873	188.9
1983	102	13.3	NA	D	1,936	164.9
1984(p)	117	18.6	NA	10.2	2,911	248.0

NA - Not Available. D - Withheld to avoid disclosure. p - Preliminary.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) Data not available prior to 1979, Machining Centers had been included in "Other" category.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN "OTHER" METAL CUTTING MACHINE TOOLS (c,d)

1962 to Date

(Values in Millions of Dollars)

	Exports of Domestic Merchandise				Imports for Consumption	
	Total Exports		Manufacturers' Export Shipments (a)			
Year	Units	Value at U.S. Port	Units	Value F.O.B. Factory	Units	Customs Import Value (b)
1962	5,704	$ 32.4	2,667	$ 31.8	5,669	$ 4.4
1963	9,636	25.4	3,382	16.7	4,849	5.6
1964	8,487	34.6	3,167	36.3	5,965	6.7
1965	9,300	44.8	2,547	39.5	8,4[illegible]4	9.7
1966	10,692	38.5	4,029	39.5	26,340	17.1
1967	9,324	42.7	2,846	37.4	20,533	26.1
1968	11,635	22.3	2,250	26.2	13,550	23.1
1969	9,869	29.5	3,080	30.7	10,832	22.4
1970	11,777	53.0	3,464	43.7	18,509	16.4
1971	10,550	21.9	2,726	22.8	20,167	15.5
1972	9,201	21.8	3,073	23.2	20,704	17.1
1973	14,554	55.5	NA	63.8	9,251	23.3
1974	27,309	90.6	NA	78.0	26,444	35.5
1975	52,902	145.7	NA	146.7	21,266	42.5
1976	98,545	99.1	NA	90.7	42,064	37.1
1977	91,551	80.6	NA	66.4	74,175	53.3
1978	107,823	115.5	NA	92.0	465,218	136.5
1979	105,962	111.7	NA	74.0	597,946	147.5
1980	53,943	150.6	NA	173.2	582,050	169.7
1981	70,191	232.1	NA	168.7	901,398	204.5
1982(r)	48,525	123.4	NA	49.2(e)	1,174,244	199.2
1983	38,895	108.4	NA	23.2(e)	1,753,390	175.7
1984(p)	40,538	77.6	NA	19.0(e)	1,331,381	252.8

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete new machines as shipped including accessories, etc., ordered and shipped with the machines; excludes home workshop tools, etc.

(b) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(c) For 1978 and prior years Machining Centers were included in "Other." After 1979 Machining Centers are classified separately.

(d) Beginning in 1980 "Used and Rebuilt" machine tools are included in Total Exports and Imports.

(e) Does not include data for Station Type Machines.

Note: See note on page 147 concerning description of categories.

Sources: Manufacturers' export shipments; U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries). All other data; U.S. Bureau of the Census, "EM 522" and "IM 146."

U.S. FOREIGN TRADE IN METAL FORMING MACHINES AND PARTS
1965 to Date
(Millions of Dollars)

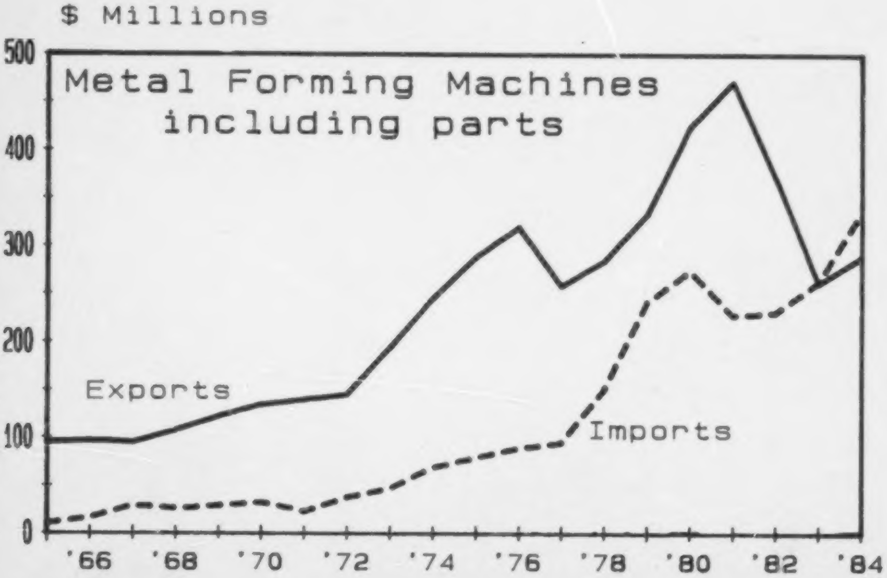
Year	Exports of Domestic Merchandise (Value at U.S. Port)								Imports for Consumption
	Total	Presses	Bending and Forming	Punching and Shearing	Forging Machines	Other New (b)	Used	Parts	Customs Import Value (a)
1965	$ 95.6	$26.1	$10.1	$ 5.6	$10.7	$ 20.2	$ 8.6	$ 14.3	$ 10.0
1966	97.3	22.5	11.2	9.8	6.0	22.6	4.9	20.3	16.2
1967	94.9	22.5	13.6	6.4	6.6	20.5	5.0	20.3	28.9
1968	107.8	33.9	10.2	5.9	5.5	25.4	3.6	23.3	25.2
1969	122.4	28.3	14.1	9.5	6.9	31.2	4.4	28.0	29.2
1970	135.1	25.9	11.0	6.5	8.3	34.2	6.1	43.1	32.4
1971	140.3	29.0	12.9	5.6	12.0	38.2	7.0	35.7	22.2
1972	145.4	34.0	11.9	5.9	11.2	37.6	11.0	33.7	37.6
1973	194.3	41.7	16.3	5.0	13.7	54.2	14.1	49.2	47.0
1974	245.7	58.6	21.3	9.4	10.8	64.9	14.5	66.3	69.0
1975	288.6	66.0	22.9	13.8	12.5	93.5	15.8	64.1	79.4
1976	320.0	80.1	26.0	20.2	13.5	101.3	15.6	63.3	89.7
1977	258.1	46.6	25.6	15.4	13.4	78.5	14.9	63.7	95.5
1978	284.9	32.3	39.2	13.7	21.0	73.9	13.6	91.2	150.7
1979	333.7	51.8	45.7	22.3	7.0	99.8	14.2	92.9	241.9
1980	424.6	69.7	44.5	44.8	16.4	95.9	18.6	134.7	274.7
1981	471.4	79.4	46.0	44.9	21.3	89.3	22.6	167.8	227.8
1982	371.9	53.8	35.1	32.9	15.3	61.7	12.5	160.5	231.3
1983	261.1	30.0	19.7	18.1	7.9	52.8	19.2	113.4	263.3
1984	289.0	36.0	19.4	22.6	11.8	60.1	9.1	129.9	336.1

(a) Generally represents a value in the foreign country, and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the machines to the United States.

(b) Beginning in 1980 "Die Casting Machines" are included.

Note: See note on page 147 concerning description of categories.

Source: U.S. Bureau of the Census, "EM 522" and "IM 146."



U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)

Units and Value, 1959 to 1972, Value 1973 to Date

(Values in Millions of Dollars)

	Total		Presses		Bending and Forming		Punching and Shearing		Forging		Other (b)	
Year	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units	Value
1959	2,166	$ 31.3	714	$15.1	793	$ 4.1	226	$ 3.0	96	$ 5.3	337	$ 3.8
1960	2,716	47.3	893	23.3	913	5.6	307	5.1	173	9.0	430	4.2
1961	2,758	55.2	934	30.7	930	4.7	283	3.8	166	8.9	445	4.1
1962	3,026	59.6	1,032	32.7	971	5.4	322	5.5	203	10.9	498	5.1
1963	2,955	42.3	943	20.1	1,135	7.6	362	6.5	112	4.7	403	3.4
1964	3,533	47.2	1,006	21.3	1,609	7.3	314	5.0	152	8.4	452	5.2
1965	3,338	44.1	751	18.4	1,600	5.6	284	4.3	148	8.4	555	7.5
1966	3,029	46.5	840	17.9	1,421	9.4	322	3.2	103	6.6	523	9.5
1967	2,824	50.2	962	24.5	933	5.6	324	5.9	98	6.3	507	7.9
1968	3,050	46.9	872	23.7	1,382	5.7	316	4.9	111	5.4	369	7.2
1969	3,380	39.9	943	14.3	1,503	5.1	536	6.5	141	6.1	257	7.9
1970	3,574	47.0	1,047	17.4	1,539	5.5	560	5.1	161	11.2	267	7.7
1971	4,491	51.9	915	22.3	1,287	5.7	461	3.7	186	13.0	1,642	7.1
1972	3,088	50.2	838	18.8	1,382	5.8	401	3.8	152	14.5	315	7.3
1973	NA	54.5	NA	21.2	NA	6.2	NA	3.4	NA	13.2	NA	10.5
1974	NA	78.4	NA	D	NA	15.7	NA	8.3	NA	D	NA	18.6
1975	NA	98.6	NA	D	NA	14.9	NA	14.7	NA	D	NA	16.8
1976	NA	105.8	NA	D	NA	16.5	NA	17.4	NA	D	NA	16.8
1977	NA	71.7	NA	D	NA	13.5	NA	16.6	NA	D	NA	12.9
1978	NA	112.8	NA	D	NA	17.4	NA	14.7	NA	D	NA	18.7
1979	NA	112.0	NA	27.7	NA	24.5	NA	16.8	NA	D	NA	D
1980	NA	152.0	NA	35.2	NA	34.5	NA	32.6	NA	D	NA	D
1981	NA	156.7	NA	43.1	NA	29.8	NA	29.5	NA	D	NA	D
1982(r)	NA	118.4	NA	36.6	NA	19.6	NA	16.2	NA	D	NA	D
1983(r)	NA	54.3	NA	13.6	NA	13.9	NA	9.8	NA	D	NA	D
1984(p)	NA	61.8	NA	15.2	NA	14.4	NA	6.8	NA	D	NA	D

NA - Not Available. D - Withheld to a void disclosure. p - Preliminary. r - Revised.

(a) Complete new machines as shipped, including accessories, etc., ordered and shipped with the machines, f.o.b. factory.

(b) Some metalworking machines, other than metal forming type machines, are included prior to 1968.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

The export figures for machine tools shown in this table and in tables and graphs in Chapter 4 are substantially lower than those on the preceding pages. This is so for several reasons: First, the data for Manufacturers' Exports cover only new and complete machine tools; second, they represent the manufacturer's selling price at the factory (F.O.B.); third, they exclude machine tools which are sold domestically but exported later by the buyer. The two sources for the tables mentioned above, NMTBA (Chapter 4) and the "Current Industrial Reports" (above), differ although they are based on the same sources. The reasons are the extent of coverage and different reporting practices. See Chapter 4 Introduction for a detailed explanation.

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF NEW MACHINE TOOLS (a)

Units and Value, 1959 to 1972, Value 1973 to Date

(Values in Millions of Dollars)

Year	Total (b)		Metal Cutting		Metal Forming (b)	
	Units	Value	Units	Value	Units	Value
1959	9,867	$ 80.8	7,701	$ 49.5	2,166	$ 31.3
1960	13,203	157.5	10,487	110.2	2,716	47.3
1961	14,080	207.2	11,322	152.0	2,758	55.2
1962	14,520	216.1	11,494	156.5	3,026	59.6
1963	15,109	144.4	12,154	102.1	2,955	42.3
1964	14,110	198.6	10,577	151.4	3,533	47.2
1965	12,475	171.3	9,137	127.1	3,338	44.1
1966	14,634	173.2	11,425	126.7	3,209	46.5
1967	12,861	194.1	10,037	143.9	2,824	50.2
1968	11,462	174.5	8,109	121.2	3,353	53.3
1969	13,083	181.5	9,406	135.2	3,677	46.3
1970	15,061	238.8	11,099	185.8	3,962	52.9
1971	13,634	191.0	8,854	133.2	4,780	57.7
1972	12,093	171.1	8,677	112.6	3,416	58.5
1973	NA	224.7	NA	170.2	NA	54.5
1974	NA	310.2	NA	231.8	NA	78.4
1975	NA	423.6	NA	325.0	NA	98.6
1976	NA	352.3	NA	246.5	NA	105.8
1977	NA	279.1	NA	207.5	NA	71.7
1978	NA	371.0	NA	258.2	NA	112.8
1979	NA	395.6	NA	283.5	NA	112.0
1980	NA	630.8	NA	482.3	NA	148.5
1981	NA	675.0	NA	518.3	NA	156.7
1982(r)	NA	427.5	NA	309.1	NA	118.4
1983(r)	NA	212.3	NA	158.0	NA	54.3
1984(p)	NA	184.2	NA	122.4	NA	61.8

NA - Not Available. p - Preliminary. r - Revised.

(a) Complete machines as shipped, including accessories, etc., ordered and shipped with the machinery at manufacturers' selling price, f.o.b. factory. Excludes rebuilt machines, machines designed primarily for home workshops, laboratories, garages, etc., and parts.

(b) Includes some metalworking type machines other than machine tools prior to 1973.

Note: See note on page 156.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery" (Quarterly and Annual Summaries).

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF SELECTED MACHINE TOOLS

1970 to 1978

(Values in Thousands of Dollars)

Machine Classification	1970	1971	1972	1973	1974	1975	1976	1977	1978
METAL CUTTING									
Boring									
Vertical Boring and Turning Mills, Standard Type	NA	NA	NA	NA	NA	NA	NA	NA	NA
Precision Boring	$ 1,918	$2,089	D	$ 1,036	$ 5,565	$ 4,755	$ 1,973	$ 1,644	$ 1,260
Gear Cutting									
Gear Hobbers	431	8,749	D	10,988	9,914	9,802	5,076	6,808	9,501
Gear Tooth Finishing	9,176								
Grinding									
External Cylindrical									
Plain	2,816	7,688					2,710		2,844
Roll and Centerless	3,416		$8,535	8,394	15,046	17,796	19,665	14,786	12,205
All Other	10,064								
Surface Grinding	5,175	2,280	D	5,422	5,235	7,426	5,096	6,801	7,829
Special Tool & Cutter Grinding	2,553	2,854	1,996	920	D	3,897	5,897	15,779	4,856
Honing	1,694	1,015	D	1,559	2,077				
Lathes									
Manufacturing and Tool Room (Up to 36")	1,089	1,900	1,789	1,959	4,111	4,985	5,430	3,143	2,010
Automatic Chucking									
Single Spindle	1,487	1,558	1,660	1,518	2,742	8,514	5,744	4,817	10,181
Multiple Spindle	9,502	7,1[illegible]	3,173	5,229	4,203	4,882	5,493	3,193	
Screw (bar) Machines	7,165	6,637	6,194	6,693	7,474	10,707	7,974	7,813	2,451
Milling									
Profile and Duplicator	5,074	3,062	1,643	2,499	1,645	2,992	D	D	2,325
Broaching	3,096	1,711	541	3,165	2,142	5,891	3,052	D	8,368
Sawing and Cut-off Machines	NA	NA	4,121	4,541	3,402	10,351	6,541	3,399	8,056
Transfer Machines	18,807	6,533	9,755	39,494	31,240	93,541	34,406	12,423	27,988
METAL FORMING									
Power Shearing									
Plate	2,322	765	1,554	2,699	3,303	8,023	7,942	7,944	5,044
Rotary								143	191
Bending and Forming, Power									
Bending Rolls, Sheet & Plate	800	1,799	2,313	2,348	9,194	3,592	3,413	3,936	2,727
Bending Brakes and Folders	1,025								
Other	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mechanical Presses									
Vertical Straight-sided and Arch Frame (Excl. Knuckle Joint)									
Single Action, Single Point, 201 Tons and Over	940	2,256	2,766	1,256	D	5,452	D	D	D
Single Action, Two Point, 500 Tons and Under (a)	1,327								
Hydraulic and Pneumatic Extrusion Presses	7,120	2,194	D	1,905	D	D	D	D	D

NA - Not Available. D - Withheld to avoid disclosing individual companies' data.

(a) Beginning in 1973: Single Action, Two Point, 300 Tons and Under.

Source: U.S. Department of Commerce, "Current Industrial Reports, Series MQ-35W, Metalworking Machinery."

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL CUTTING MACHINE TOOLS

1979 to DATE

(Values in Millions of Dollars)

Machine Classification	1979	1980	1981	1982(r)	1983(r)	1984(p)
METAL CUTTING MACHINE TOOLS	$283.5	$482.3	$518.3	$309.1	$158.0	$122.4
Boring Machines	9.5	17.7	D	14.9	D	D
Drilling Machines	4.2	12.2	12.1	3.4	5.1	1.2
Valued under $2,500	.3	.2	.2	D	D	D
All other Drilling Machines	3.9	12.0	12.0	D	D	D
Gear Cutting Machines	D	D	D	D	D	D
Grinding, Polishing, Buffing, Honing & Lapping Machines	42.0	75.4	88.2	69.3	54.2	34.1
Valued under $2,500	.7	.6	.6	.4	.4	D
External Cylindrical Grinding Plain (incl. angular wheel type) & Universal	6.3	D	10.4	10.3	D	D
Roll, Centerless, & Chuck type grinders	D	D	30.4	26.4	21.5	D
All other External types	5.7	D				
Internal Cylindrical Grinding Surface Grinding Machines:						
Rotary & Reciprocating table type	5.4	10.3	10.3	9.2	D	D
All other Surface Grinders	D	2.0	36.5	5.3	2.7	D
All other Grinding Machines	D	15.3			5.0	14.0
Honing & Lapping Machines	5.6	18.3		17.6	14.9	5.0
Polishing & Buffing Machines						
Horizontal NC Turning Machines	16.9	21.6	21.2	17.2	D	D
Vertical NC Turning Machines	D	D	D	2.5	D	0
Non-NC Turning Machines	28.7	29.2	37.3	17.1	9.9	5.2
Valued under $2,500	1.4	1.5	D	D	D	D
Engine or Tool Room lathes, swing over cross slide	D	D	3.1	2.2	D	D
Turret lathes, horizontal	D	D	6.4			
Automatic lathes				D	D	D
Single Spindle	D	D				
Multiple Spindle	10.5	14.7	26.3	D	D	D
All other Horizontal lathes	D	D	D	4.6	D	D
All other Vertical lathes						
Milling Machines	20.1	27.9	33.4	21.0	9.0	16.1
Machining Centers	D	57.9	43.0	D	D	10.2
Drill, Mill, Bore, manual tool change	D	D	D	D	D	D
Drill, Mill, Bore, (ATC) Vertical	12.3	18.4	15.0	D	D	4.5
Horizontal	33.7	36.2	24.4	19.3	D	D
All other Machining Centers	D	D	D	D	D	D
Station Type Machines	47.4	133.9	111.0	D	D	D
Other Metal Cutting Machines	26.6	39.3	57.8	49.2	23.2	19.0

D - Withheld to avoid disclosure. r - Revised. p - Preliminary.

Source: U.S. Commerce Department, Current Industrial Reports, MQ-35W.

5

U.S. MANUFACTURERS' EXPORT SHIPMENTS OF METAL FORMING MACHINE TOOLS

1979 to DATE

(Values in Millions of Dollars)

Machine Classification	1979	1980	1981	1982(r)	1983(r)	1984(p)
METAL FORMING MACHINE TOOLS	$112.0	$148.5	$156.7	$118.4	$54.3	$61.8
Punching, Shearing, Bending and Forming Machines	41.3	63.2	59.3	35.7	23.7	21.2
All Punching & Shearing valued under $2.500	3	5	6	3	2	2
Punches, incl. combination Punching & Shearing Machines	11.7	21.7	19.6	3.2	8.2	4.8
Punching Machines fixed position and two axes positioning table				7.0		
Plate Shearing Machines	4.8	10.3	9.3	15.7	1.3	1.7
Other Punching & Shearing						
All Bending & Forming valued under $2.500	7	1.0	9	7	4	4
Press Brakes	11.9	15.5	16.6	8.7	6.1	13.9
Bending Rolls						
Rotary Bending & Forming Machines (incl. Rotary Head)						
Ram & Press Bending Machines						
Other Bending & Forming	11.9	14.2	12.3	10.2	7.4	
Presses, except forgings	27.7	35.1	43.1	36.6	13.6	15.2
Presses valued under $2.500	4	7	2	4	3	D
Mechanical Presses:						
Open Back Inclinable	2.1	D	3.8	D	D	D
Other Mechanical Presses	16.7	22.7	25.0	15.4	5.8	D
Hydraulic Presses	8.6	D	14.3	D	D	D
Forging Machines	D	D	D	D	D	D
Other Metal Forming Machines	D	D	D	D	D	D
Thread Rolling	D	D	D	D	D	D
Metal Container Making Machinery	NA	NA	NA	10.3(a)	7.5(a)	6.6(a)
Die Casting	D	D	D	D	D	D
Riveting Machines	D	D	D	D	D	D
Other Metal Forming Machines	16.2	25.7	19.4	7.7	4.4	8.3

NA - Not Available. D - Withheld to avoid disclosure. r - Revised. p - Preliminary

(a) "Metal Container Making Machinery" was included with "Other Metal Forming Machines" prior to 1982.

Source: U.S. Commerce Department, Current Industrial Reports, MQ-35W.

6

WORLD MACHINE TOOL INDUSTRY

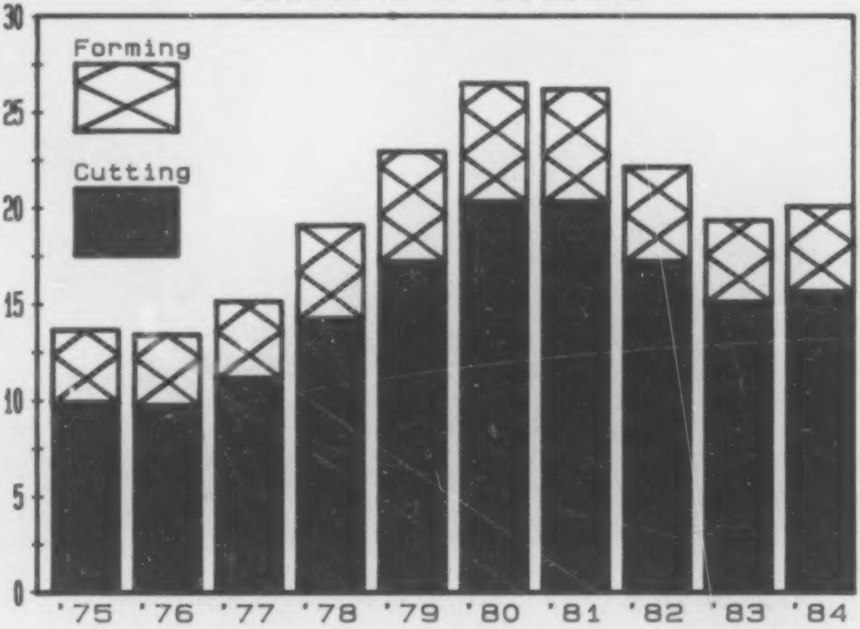
As is the case with many other manufactured products, the machine tool market has rapidly become internationalized over the course of the past fifteen years. During the 1960's the majority of the world's machine tools came from the U.S. and western Europe. This is no longer the case as Japan has become a formidable global competitor and many developing nations have machine tool industries of their own. Therefore, in order to accurately reflect the state of the machine tool industry and market in the U.S., it is necessary to put it into a global context. The statistics in this chapter are intended to do this. Using a wide variety of information, obtained primarily from foreign governments and trade associations, this chapter contains a comprehensive review of worldwide machine tool production, exports and imports.

For many years American Machinist magazine has been publishing estimates of the world's machine tool production and trade. These estimates, which cover 36 countries, come from unofficial sources and are revised for previous years when "official" figures become available. Whenever possible, data include complete machine tools only and exclude parts and attachments. However, for some countries it is not clear if the totals include or exclude the value of parts.

Several years ago, the trade associations of 14 European countries (co-operating through a group called CECIMO) and the United States, Japanese, and Indian trade associations agreed to develop a uniform international statistical reporting system. Under this system, the production, exports and imports of the participating countries are reported for seven major groups of metal cutting machine tools and three major groups of metal forming machine tools. Data by machine type for 1983 are included in this chapter. The machine tool production of the 15 countries totaled about $12.3 billion in 1983.

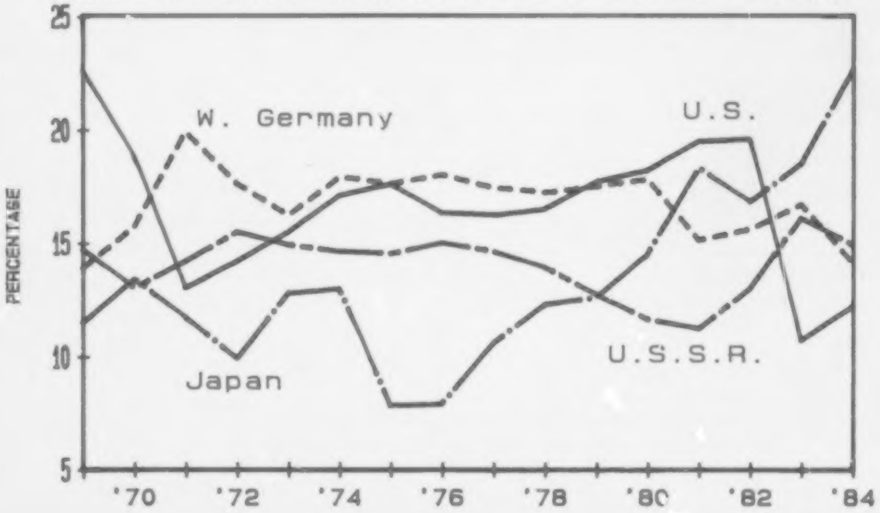
In the uniform international statistical reporting system for CECIMO, each participating country reports its data in Swiss Francs. In this chapter, these data have been converted into dollars with the conversion rates below the tables. These tables can be identified with the source as International Statistics on Machine Tools.

With the "floating" of many world currencies and the rapid rise of the value of the dollar in recent years, the value measurement of production and trade statistics has become increasingly confusing. Foreign data in this Handbook have been converted into dollars on the basis of the trade conversion factors given in the International Monetary Fund's "International Financial Statistics." It may be useful to convert the dollar-denominated statistics back into national currency when one is attempting to analyse rates of change. The dollar-denominated figures frequently show declines whereas national currency figures may reflect healthy gains.



World Machine Tool Production

Billions of Dollars



SHARE OF WORLD MACHINE TOOL OUTPUT

(Machine Tool Output as % of World Output)

WORLD MACHINE TOOL PRODUCTION, 1968 to Date

(Millions of U.S. Dollars) (a)

Years	Total	Metal Cutting	Metal Forming
1968	$ 6,543.3	$ 4,941.2	$1,552.6
1969	7,474.6	5,590.9	1,833.7
1970	8,268.2	6,069.2	2,142.0
1971	8,148.9	5,951.5	2,192.4
1972	8,965.1	6,433.1	2,532.0
1973	11,548.1	8,393.2	3,154.9
1974	12,656.3	9,190.0	3,466.3
1975	13,640.0	9,844.3	3,795.7
1976	13,387.4	9,672.5	3,714.9
1977	15,126.5	11,079.8	4,046.7
1978	19,088.4	14,192.8	4,889.4
1979	22,925.1	17,170.1	5,755.0
1980	26,501.3	20,268.4	6,232.8
1981	26,209.5	20,274.9	5,934.5
1982	22,071.3	17,171.4	4,957.0
1983(r)	19,344.2	15,042.2	4,302.0
1984(p)	20,080.0	15,576.9	4,502.9

p - Preliminary. r - Revised.

(a) Metal Cutting and Metal Forming may add to less than the total because a breakdown was not available for some countries.

Source: McGraw-Hill, Inc. "American Machinist," Uniform International Statistics on Machine Tools, and statistics reported by individual countries' machine tool associations.

For many years, the "American Machinist" has published estimates of world machine tool production. When it was possible to do so, parts and attachments were excluded. Beginning with 1974, the trade associations of 13 European countries, the United States, Japan, and India have been collecting statistics on production, exports, and imports on a uniform basis. For details, see chapter introduction.

LEADING MACHINE TOOL CONSUMING NATIONS (a)

1984 and 1983

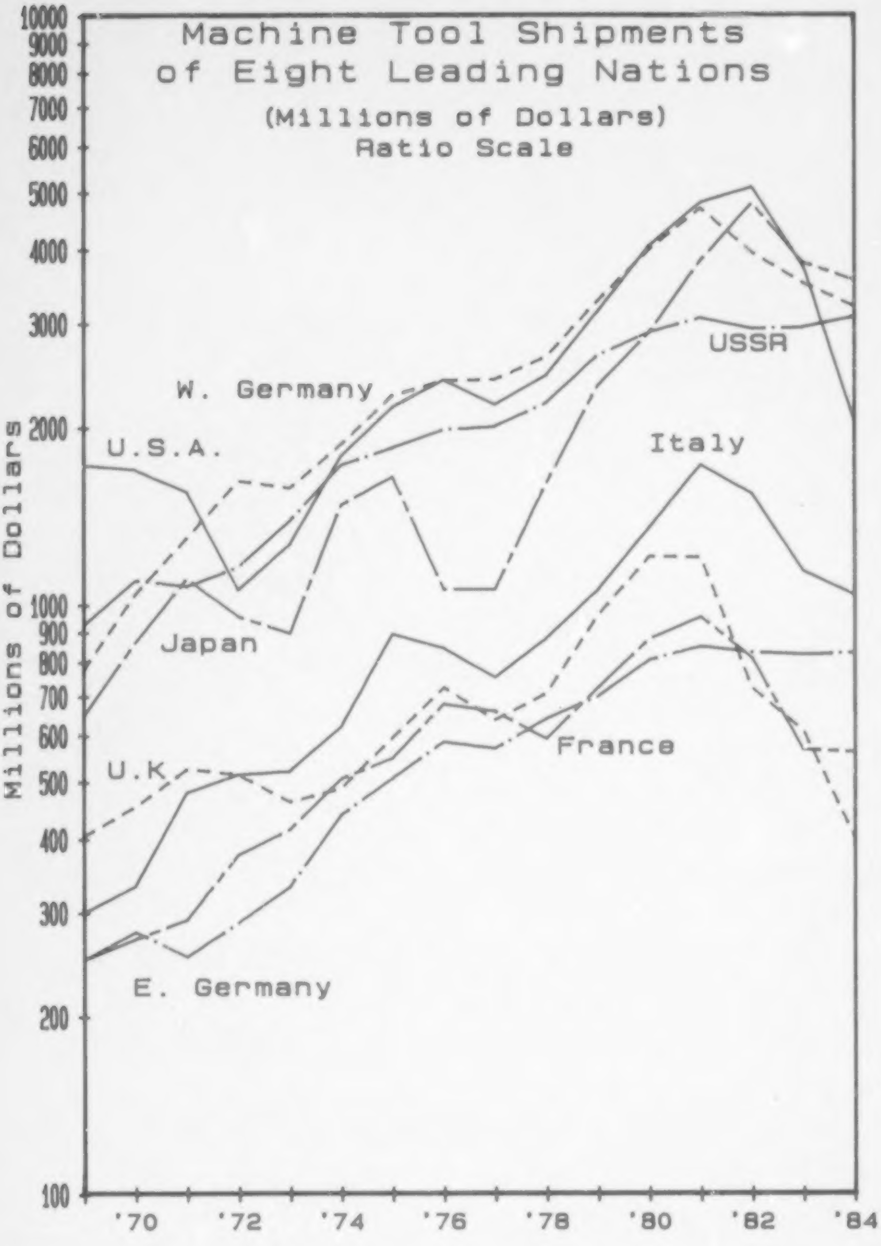
(Millions of U.S. Dollars)

Country	1984	1983	Percent Change(b)	
			U.S. Dollars	Nat'l. Currency
1. U.S.S.R.	$4,107.8	$4,279.6	-4.0%	7.1%
2. United States	3,358.0	2,607.0	28.8%	28.8%
3. Japan	2,915.4	2,458.8	18.6%	18.6%
4. FRG (West Germany)	1,292.9	1,696.2	-23.8%	-15.1%
5. Italy	620.5	615.4	.8%	16.6%
6. PRC (China)	597.0	590.5	1.1%	18.9%
7. United Kingdom	437.8	398.1	10.1%	24.8%
8. France	516.6	616.0	-16.1%	-3.9%
9. Canada	444.4	421.5	5.4%	10.8%
10. Romania	363.2	449.6	-19.2%	5.0%
11. India	305.5	311.0	10.5%	-1.8%
12. Bulgaria	227.5	222.5	2.2%	2.2%
13. Mexico	205.0	121.0	69.4%	0.0%
14. Switzerland	173.2	211.9	-18.3%	-8.6%
15. Czechoslovakia	172.1	192.5	-10.6%	-4.6%
16. Yugoslavia	171.2	234.2	-26.9%	16.8%
17. Sweden	161.5	150.6	7.2%	15.7%
18. GDR (East Germany)	161.3	171.2	-5.8%	5.0%
19. Taiwan	156.8	188.6	-16.9%	-16.1%
20. South Korea	155.4	104.3	49.1%	54.8%
21. Spain	154.3	175.0	-11.8%	-1.2%
22. South Africa	145.2	188.1	-22.8%	1.8%
23. Australia	142.7	174.2	-18.1%	-15.9%
24. Hungary	137.0	152.9	-10.4%	-10.4%

(a) Machine tool consumption is domestic production plus imports and minus exports.

(b) Percent change calculations based on U.S. dollars include the effect of changes in currency conversion rates. Percent change calculations based on national currency differ from some countries. These percent change values are not influenced by currency conversion rates and, therefore, may more realistically reflect changes in a nation's machine tool consumption.

Source: McGraw-Hill, Inc., "American Machinist," International Statistics on Machine Tools and NMTBA.


Machine Tool Shipments
of Eight Leading Nations
(Millions of Dollars)
Ratio Scale
Millions of Dollars
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
900
800
700
600
500
400
300
200
100
'70
'72
'74
'76
'78
'80
'82
'84
W. Germany
U.S.A.
USSR
Italy
Japan
France
U.K.
E. Germany

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1984 (ESTIMATED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 4,474.6	$ 3,709.6	$ 765.0	$1,741.0	$ 181.8
2. FRG (West Germany)	2,803.8	1,971.2	832.6	1,967.7	456.8
3. Soviet Union*	2,953.4	2,296.1	657.3	235.7	1,390.1
4. United States	2,412.5	1,722.2	690.2	373.5	1,319.0
5. Italy	996.0	713.0	263.0	558.0	182.5
6. GDR (East Germany)	781.0(c)	608.6(c)	172.3(c)	725.1(c)	105.4(c)
7. Switzerland	714.8	663.8	51.1	672.0	130.4
8. France	465.5	376.2(a)	89.3(a)	250.1	301.2
9. PRC (China)	494.4(c)	376.2(c)	118.2(c)	37.6(c)	140.3(c)
10. United Kingdom	376.9	313.6	63.3	278.6	339.5
11. Rumania	354.5(c)	323.0(c)	31.5(c)	92.5(c)	101.1(c)
12. Czechoslovakia	353.4	310.3	43.0	269.7	88.4
13. Canada	319.3	256.5	62.8	121.5	246.5
14. Taiwan	231.7	215.0	16.7	181.1	105.2
15. Spain	211.5	157.1(a)	54.4(a)	113.3	56.1
16. Yugoslavia	204.9	141.8	63.1	121.4	87.6
17. India	193.7	161.4	32.3	20.5	132.3
18. Bulgaria*	192.5(c)	175.0(c)	17.5(c)	170.0(c)	205.0(c)
19. S. Korea	160.7	132.5	28.2	34.6	29.3
20. Sweden	157.9	93.1	64.8	163.6	167.2
21. Hungary*	147.0	129.0	18.0	105.0	95.0
22. Austria	128.1	86.2	41.9	118.3	86.7
23. Netherlands	106.8	64.1	42.7	93.7	108.4
24. Brazil	103.6	87.4	16.2	27.7	39.3
25. Poland*	98.4	85.4	13.0	57.7	48.8
26. Israel	77.0	77.0	0.0	66.0	90.0
27. Denmark	74.8	50.7	24.1	60.0	51.2
28. Belgium	74.7	26.1	48.5	85.4	101.5
29. Australia	64.1(j)	43.9(j)	20.2(j)	6.3(j)	84.9(j)
30. Argentina	28.2	15.0	13.2	14.0	33.0
31. Singapore	20.8	19.3	1.5	57.4	138.5
32. South Africa	17.0	10.2	6.8	0.0	128.2
33. Mexico	17.0(c)	12.0(c)	5.0(c)	2.0(c)	190.0(c)
34. Finland	15.4	1.7	13.6	13.8	59.9
35. Portugal	12.3	6.1	6.1	4.1	24.6
36. Hong Kong	4.2(c)	3.6(c)	0.6(c)	0.9	5.2
Total	19,842.4	15,433.9	4,408.0	8,839.8	7,051.9

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.
(c) Rough estimate from fragmentary data.
(j) Year ended June 30.

* - Countries with controlled currencies. The Soviet Union and Czechoslovakia have been converted at 80% of the official rate; Bulgaria and GDR at 65%; Poland at 50% of the offical rate; Hungary, PRC (China), and Romania at IMF commercial rates.

Exchange Rates: All free-market currencies have been converted at rates in effect for the period covered. Most estimates for 1984 have been converted at International Monetary Fund rates for the first nine months of 1984 plus estimates of bank transfer rates for the last three months; the rest have been converted at 1984 average rates

Notes: Whenever possible, data include machine tools only, excluding parts and attachments. Individual items may not add to totals due to rounding.

Source: McGraw-Hill, Inc., "American Machinist," and NMTBA.

WORLD MACHINE TOOL PRODUCTION AND TRADE, 1983 (REVISED)

(Millions of U.S. Dollars)

	Production			Trade	
	Total	Cutting	Forming	Export	Import
1. Japan	$ 3,541.8	$ 2,953.6	$ 588.0	$1,254.0	$ 171.0
2. FRG (West Germany)	3,193.5	2,251.6	941.8	1,950.4	453.1
3. Soviet Union*	3,076.9	2,369.5	707.4	245.6	1,448.3
4. United States	2,044.9	1,464.2	580.6	359.0	921.1
5. Italy	1,037.0	747.3	289.7	603.4	181.8
6. GDR (East Germany)*	829.0(u)	646.1(u)	182.9(u)	769.7(u)	111.9(u)
7. Switzerland	766.5	711.7	54.8	670.9	116.3
8. France	560.1	453.1	107.0	295.2	351.1
9. PRC (China)	475.5(u)	354.6(u)	120.9(u)	35.0(u)	150.0(u)
10. Romania	438.9(c)	400.0(c)	39.0(c)	114.5(c)	125.2(c)
11. United Kingdom	400.7	330.0	70.7	28[illegible].2	286.6
12. Czechoslovakia	374.7	329.5	45.3	264.3	82.1
13. Canada	290.5	234.9	55.6	55.5	186.5
14. Yugoslavia	231.0	162.0	68.9	134.6	137.9
15. Taiwan	211.0	196.2	14.8	135.4	113.0
16. Spain	188.2	139.8	48.4	99.4	86.2
17. India	184.0	154.4	29.6	21.5	148.5
18. Bulgaria*	182.5(c)	165.0(c)	17.5(c)	165.0(c)	205.0(c)
19. Sweden	142.8	84.1	58.7	161.3	169.1
20. Hungary*	135.0	118.5	16.5	97.5	115.4
21. Austria	127.9	83.7	44.2	127.3	105.0
22. S. Korea	119.2	98.3	21.0	35.9	21.0
23. Poland*	105.5	91.8	13.6	64.3	54.9
24. Brazil	98.1	82.8	15.3	24.1	44.2
25. Belgium	84.5	29.8	54.7	96.5	114.8
26. Australia	65.9(j)	45.1(j)	20.8(j)	4.5(j)	112.8(j)
27. Israel	65.0	65.0	0.0	56.0	90.0
28. Denmark	39.0(a)	24.1(a)	14.9(a)	39.8	42.1
29. Argentina	28.2	15.0	13.2	14.0	23.5
30. Netherlands	25.0(a)	12.9(a)	12.2(a)	56.0	73.6
31. South Africa	23.4	13.5	9.9	4.4	169.1
32. Finland	15.1	1.7	13.3	21.5	69.7
33. Singapore	15.0	13.2	1.9	45.9	113.0
34. Mexico	13.0(c)	9.0(c)	4.0(c)	2.0(c)	110.0(c)
35. Portugal	12.7	6.4	6.3	2.4	23.1
36. Hong Kong	5.3(c)	4.5(c)	0.8(c)	1.1	2.4
Total	19,147.2	14,862.9	4,284.2	8,317.1	6,729.3

(a) Estimated by NMTBA using totals from national trade associations and AM proportional metal cutting and metal forming shares.
(c) Rough estimate from fragmentary data.
(j) Year ended June 30.
(u) Unrevised.

* - Countries with controlled currencies. The Soviet Union and Czechoslovakia have been converted at 80% of the official rate, Bulgaria and GDR at 65% of the FRG rate; Poland at 50% of the offical rate; Hungary, PRC (China), and Romania at IMF commercial rates.

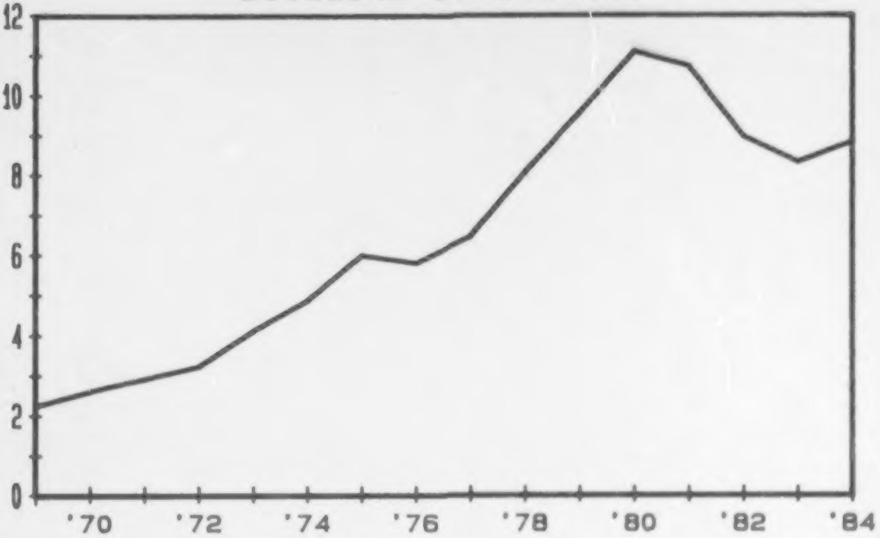
Exchange Rates: All free market currencies have been converted at rates for the period covered. Most estimates for 1983 have been converted at International Monetary Fund rates for the first nine months of 1983 plus estimates of bank transfer rates for the last three months; the rest have been converted at 1983 average rates.

Notes: Whenever possible, data include complete machine tools only, excluding parts and attachments. individual items may not add to totals due to rounding.

Source: McGraw-Hill, Inc., "American Machinist," and NMTBA.

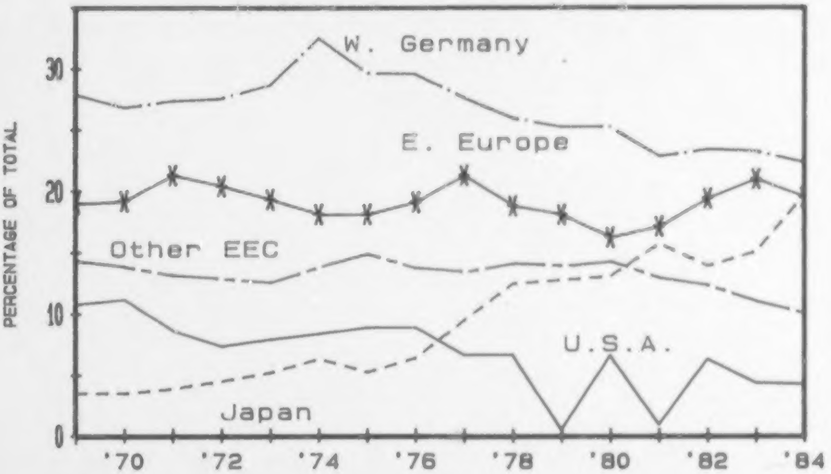
World Exports of Machine Tools

Billions of Dollars



Share of World Exports

(Machine Tool Exports as a % of World Exports)



PRODUCTION, EXPORTS AND IMPORTS OF MACHINE TOOLS

Selected Countries, 1981 to 1983

(Millions of U.S. Dollars)

	Production			Exports			Imports		
Country	1981	1982	1983	1981	1982	1983	1981	1982	1983
Austria	$ 108.4	$ 127.2	$ 94.8	$ 108.4	$ 121.0	$ 127.3	$ 292.1	$ 181.1	$104.9
Belgium	103.3	101.0	82.1	119.2	116.2	96.6	139.5	116.9	114.8
Denmark	41.6	35.5	39.0	47.9	41.8	39.8	45.1	45.0	42.1
France	809.4	564.8	560.0	390.4	295.0	295.2	566.5	479.3	351.1
India	184.6	182.9	184.0	17.1	18.2	21.5	86.6	153.9E	148.5E
Italy	1,512.1	1,138.6	1,037.0	795.2	638.1	592.6	300.0	208.5	181.7
Japan	4,796.9	3,796.4	3,541.1	1,682.9	1,272.5	1,263.6	215.7	220.4	171.3
Netherlands	60.5	47.6	29.3	74.2	66.2	56.0	110.6	93.6	73.6
Portugal	16.2	15.7E	12.7E	4.1	3.1E	2.4E	53.9	37.7E	23.1E
Spain	319.6	259.4	193.1	206.8	174.9	99.4	141.8	176.1	86.3
Sweden	204.8	179.9E	156.6E	164.3	138.3	114.5	191.6	151.2	129.5
Switzerland	846.2	816.1	673.6	740.3	714.2	583.6	188.9	157.6	101.0
United Kingdom	720.7	607.7	398.8	577.7E	477.7	319.0	432.6	408.8	294.3
United States	5,131.0	3,745.0	2,132.7	949.0	574.0	359.1	1,432.0	1,218.0	921.1
West Germany	3,953.1	3,505.0	3,193.5	2,584.9	2,206.4	1,950.4	616.4	488.6	452.7

E - Estimate.

Exchange Rate: 1981 $1 = 2.0303 Swiss Francs; 1982 $1 = 2.0303 Swiss Francs; 1983 $1 = 2.0991 Swiss Francs.

Note: On the following pages data for some individual types of machine tools are not available (NA). The "Total" for those countries do not reflect the missing data.

Source: International Statistics on Machine Tools jointly prepared by CECIMO (Comité Européen de Coopération des Industries de la Machine Outil); IMTMA (Indian Machine Tool Manufacturers' Association); JMTBA (Japan Machine Tool Builders' Association); and NMTBA.

PRODUCTION, EXPORTS AND IMPORTS OF COMPLETE MACHINE TOOLS
Selected Countries, 1983
(Millions of U.S. Dollars)

	Production			Exports			Imports		
Country	Total	Cutting	Forming	Total	Cutting	Forming	Total	Cutting	Forming
Austria	$ 94.8	$ 56.4	$ 38.4	$ 127.3	$ 67.5	$ 59.8	$104.9	$ 59.2	$ 45.7
Belgium	82.1	25.2	56.9	96.6	50.3	46.3	114.8	87.0	27.8
Denmark	39.0	NA	NA	39.8	NA	NA	42.1	NA	NA
France	560.0	452.8	107.2	295.2	207.2	88.0	351.1	252.7	98.4
India	184.0	154.4	29.6	21.5	18.9	2.6	148.5E	NA	NA
Italy	1,037.0	747.3	289.7	592.6	451.7	140.9	181.7	144.2	37.5
Japan	3,541.1	2,956.7	584.4	1,263.6	999.7	263.9	171.3	136.9	34.4
Netherlands	29.3	NA	NA	56.0	24.5	31.5	73.6	48.4	25.2
Portugal	12.7E	NA	NA	2.4E	NA	NA	23.1E	NA	NA
Spain	193.1	143.4	49.7	99.4	69.0	30.4	86.3	63.0	23.3
Sweden	156.6E	96.5E	60.1E	114.5	59.5	55.0	129.5	91.2	38.3
Switzerland	673.6	618.8	54.8	583.6	556.9	26.7	101.0	NA	NA
United Kingdom	398.8E	328.9E(a)	69.9E	319.0	221.3	97.7	294.3	220.8	73.5
United States	2,132.7	1,585.0	547.7	359.1	230.6	128.5	921.1	697.0	224.1
West Germany	3,193.5	2,251.6	941.9	1,950.4	1,308.1	642.3	452.7	312.9	139.8

NA - Not Available. E - Estimate.

(a) Data includes NC forming machines.

Source: International Statistics on Machine Tools.

PRODUCTION OF COMPLETE METAL CUTTING MACHINE TOOLS
Selected Countries, 1983
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 56.3	$ 7.4	(a)	$ 0.0	$ 6.4	$ 23.4	$ 8.1	$ 11.0
Belgium	25.2	NA	NA	NA	NA	NA	NA	NA
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	452.9	0.5	$ 6.6	NA	27.6	78.7	65.9	273.6
India	154.4	10.6	10.2	5.1	17.2	56.8	18.8	35.5
Italy	747.3	32.9	24.4	7.9	52.7(c)	122.5	92.8	414.1
Japan	2,956.7	108.4	56.8	40.4	306.5	668.1	274.8	1,501.7
Netherlands	NA	NA	NA	NA	NA	NA	NA	NA
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	143.4	9.4	7.0	0.1	11.7	42.2	44.5	28.6
Sweden (E)	96.5	8.2	(a)	0.0	43.0	24.9	18.3	2.1
Switzerland	618.8	NA	NA	NA	NA	NA	NA	NA
United Kingdom (E)	328.9	4.2	3.7	(b)	36.2	94.8	20.4	169.6(d)
United States	1,585.0	95.1	60.5	35.6	283.7	345.7	186.9	577.5
West Germany	2,251.6	108.5	60.7	97.1	375.6	571.0	304.7	734.0

NA - Not Available. E - Estimate.

(a) Data included in "Boring Machines."
(b) Data included in "Other Metal Cutting."
(c) Data includes Grinding machines only.
(d) Data for both cutting and forming NC machines are included in "Other Metal Cutting," except for NC Lathes.

Note: Individual items may not add to "Total" due to rounding.

Source: International Statistics on Machine Tools.

PRODUCTION OF COMPLETE METAL FORMING MACHINE TOOLS
Selected Countries, 1983
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 38.4	$ 2.7	$ 4.0	$ 31.7
Belgium	56.9	NA	NA	NA
Denmark	NA	NA	NA	NA
France	107.2	14.0	36.9	56.3
India	29.6	2.7	11.9	15.1
Italy	289.7	38.8	76.4	174.5
Japan	584.4	63.3	444.6	76.5
Netherlands	NA	NA	NA	NA
Portugal	NA	NA	NA	NA
Spain	49.7	8.8	15.2	25.6
Sweden (E)	60.1	30.1	(a)	30.0
Switzerland	54.8	NA	NA	NA
United Kingdom	69.9(c)	(b)	24.3E(c)	45.6(c)
United States	547.7	116.6	149.2(d)	281.9
West Germany	941.9	152.0	397.1	392.8

NA - [illegible] Available. E - Estimate.

(a) Included in "Punching & Shearing."
(b) Data included in "Other Metal Forming."
(c) Data for NC Machines are included in "Other Metal Cutting."
(d) Data for Forging Presses incuded in "Other Metal Forming."

Source: International Statistics on Machine Tools.

IMPORTS OF COMPLETE METAL CUTTING MACHINE TOOLS
Selected Countries, 1983
(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 59.2	$ 8.4	(a)	$ 0.1	$15.0	$ 17.0	$12.1	$ 6.7
Belgium	87.0	3.2	$5.6	5.0	11.0	19.5	8.8	33.9
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	252.7	14.7	23.9	7.3	48.9	64.4	37.4	56.0
India	NA	NA	NA	NA	NA	NA	NA	NA
Italy	144.2	16.5	5.9	4.0	25.7(b)	26.3	10.5	55.3
Japan	136.9	3.0	11.4	11.5	43.2	14.2	9.6	44.0
Netherlands	48.4	2.8	4.6	0.7	8.8	14.0	10.2	7.4
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	63.0	0.7	1.1	8.0	13.4	9.7	5.5	24.7
Sweden	91.2	3.3	(a)	1.3	15.7	22.2	19.7	29.1
Switzerland	NA	NA	NA	NA	NA	NA	NA	NA
United Kingdom	220.8	11.3	9.6	2.2	38.5	66.1	19.1	74.1
United States	697.0	34.6	9.9	13.8	89.5	175.7	52.5	320.9
West Germany	312.9	47.8	25.1	7.8	62.3	71.7	52.5	45.8

NA - Not Available.

(a) Included in "Boring Machines."
(b) Data for Grinding machines only.

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

IMPORTS OF COMPLETE METAL FORMING MACHINE TOOLS
Selected Countries, 1983
(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 45.7	$ 8.7	$ 9.7	$ 27.3
Belgium	27.8	9.1	6.6	12.0
Denmark	NA	NA	NA	NA
France	98.4	15.5	32.3	50.6
India	NA	NA	NA	NA
Italy	37.5	5.9	13.2	18.4
Japan	34.4	4.6	11.0	18.8
Netherlands	25.2	8.8	3.9	12.6
Portugal	NA	NA	NA	NA
Spain	23.3	3.3	6.7	13.2
Sweden	38.3	20.0	(a)	18.4
Switzerland	NA	NA	NA	NA
United Kingdom	73.5	22.2	22.4	28.9
United States	224.1	35.5	52.2(b)	136.4
West Germany	139.8	22.7	29.4	87.7

NA - Not Available.

(a) Data included in "Punching and Shearing."
(b) Data for Forging Presses included in "Other Metal Forming."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF COMPLETE METAL CUTTING MACHINE TOOLS

Selected Countries, 1983

(Millions of U.S. Dollars)

Country	Total	Boring Machines	Drilling Machines	Gear Cutting & Finishing	Grinding & Polishing	Lathes	Milling Machines	Other Metal Cutting
Austria	$ 67.5	$ 7.1	(a)	$ 0.1	$ 10.4	$ 36.4	$ 6.5	$ 7.1
Belgium	50.3	8.3	$ 1.3	1.1	3.0	13.4	2.0	21.2
Denmark	NA	NA	NA	NA	NA	NA	NA	NA
France	207.2	3.5	15.4	4.1	79.8	40.7	36.1	27.7
India	18.9	0.0	2.5	0.0	1.4	9.2	5.1	0.8
Italy	451.7	48.1	45.4	4.0	52.7(b)	81.6	54.6	165.3
Japan	999.7	41.1	45.0	10.0	82.7	301.5	61.9	457.5
Netherlands	24.5	2.8	1.1	0.4	10.5	4.9	1.4	3.5
Portugal	NA	NA	NA	NA	NA	NA	NA	NA
Spain	69.0	5.4	4.6	0.1	5.9	13.2	30.1	9.5
Sweden	59.5	5.1	(a)	0.4	31.3	13.4	6.4	2.9
Switzerland	556.9	NA	NA	NA	NA	NA	NA	NA
United Kingdom	221.3	13.3	13.3	3.1	50.8	64.4	38.9	37.6
United States	230.6	12.9	8.3	11.8	49.0	40.6	13.9	94.1
West Germany	1,308.1	100.3	42.3	49.3	281.6	358.8	197.4	278.5

NA - Not Available.

(a) Data included in "Boring Machines."
(b) Data includes Grinding machines only.

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORTS OF COMPLETE METAL FORMING MACHINE TOOLS

Selected Countries, 1983

(Millions of U.S. Dollars)

Country	Total	Punching & Shearing	Presses, Including Forging	Other Metal Forming
Austria	$ 59.8	$ 1.1	$ 7.9	$ 50.8
Belgium	46.3	10.1	22.7	13.5
Denmark	NA	NA	NA	NA
France	88.0	14.6	21.0	52.5
India	2.6	1.2	1.3	0.1
Italy	140.9	23.7	44.1	73.1
Japan	263.9	51.3	88.9	123.7
Netherlands	31.5	7.0	6.7	17.9
Portugal	NA	NA	NA	NA
Spain	30.4	6.8	8.6	15.1
Sweden	55.0	32.3	(a)	22.7
Switzerland	26.7	NA	NA	NA
United Kingdom	97.7	14.7	32.3	50.7
United States	128.5	18.1	30.0(b)	80.4
West Germany	642.3	85.8	166.8	389.7

NA - Not Available.

(a) Data included in "Punching and Shearing."
(b) Data for Forging Presses included in "Other Metal Forming."

Note: Individual items may not add to totals due to rounding.

Source: International Statistics on Machine Tools.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
World																		
1974	$3,886	100.0%	$449	12.6%	$1,567	40.3%	$ 307	7.9%	$398	10.3%	$319	8.2%	$250	6.4%	$236	6.1%	$ 93	2.4%
1975	4,620	100.0	580	12.5	1,748	37.8	309	6.7	440	9.5	431	9.3	362	7.8	320	6.9	113	2.5
1976	4,428	100.0	553	12.5	1,670	37.7	363	8.2	457	10.3	364	8.2	317	7.2	272	6.1	115	2.6
1977	4,855	100.0	458	9.4	1,772	36.5	611	12.6	498	10.2	437	9.0	323	6.7	269	5.5	123	2.5
1978	6,279	100.0	585	9.3	2,086	33.2	1,017	16.2	659	10.5	596	9.5	426	6.8	383	6.1	139	2.2
1979	7,440	100.0	685	9.2	2,441	32.8	1,229	16.5	792	10.6	690	9.3	474	6.4	459	6.2	176	2.4
1980	8,679	100.0	831	9.6	2,739	31.6	1,454	16.8	871	10.0	845	9.7	674	7.8	516	5.9	181	2.1
Industrial Countries																		
United States																		
1974	$ 308	100.0%	—	—	$ 85	27.6%	$ 52	16.7%	$ 36	11.6%	$ 20	6.4%	$ 30	9.9%	$ 14	4.4%	$ 10	3.2%
1975	322	100.0	—	—	95	29.4	54	16.8	29	9.1	17	5.3	39	12.2	15	4.6	11	3.3
1976	317	100.0	—	—	97	30.7	70	22.0	27	8.5	15	4.7	34	10.8	9	2.7	8	2.7
1977	422	100.0	—	—	106	25.0	111	26.4	35	8.3	17	4.1	47	11.0	10	2.5	18	4.2
1978	678	100.0	—	—	166	24.6	219	32.3	59	8.7	30	4.4	73	10.8	18	2.6	25	3.7
1979	974	100.0	—	—	191	19.6	365	37.5	71	7.3	41	4.2	96	9.9	26	2.6	32	3.3
1980	1,264	100.0	—	—	243	19.2	519	41.1	95	7.5	58	4.6	135	10.7	31	2.4	31	2.4
West Germany																		
1974	167	100.0	$ 17	10.4%	—	—	8	4.8	50	29.8	24	14.1	13	7.8	20	11.9	47	3.9
1975	191	100.0	14	7.4	—	—	9	4.9	54	28.5	30	16.0	18	9.5	26	13.4	7	3.9
1976	201	100.0	17	8.2	—	—	10	4.9	60	30.0	28	13.8	19	9.3	21	10.5	10	4.9
1977	290	100.0	25	8.5	—	—	23	7.9	80	27.5	53	18.3	23	7.8	27	9.4	16	5.5
1978	381	100.0	31	8.1	—	—	39	10.2	122	32.1	56	14.6	29	7.6	37	9.6	14	3.7
1979	537	100.0	32	5.9	—	—	83	15.4	174	32.5	71	13.2	32	5.9	48	9.0	18	3.3
1980	685	100.0	36	5.3	—	—	108	15.8	206	30.0	102	14.9	59	8.6	55	8.0	25	3.7

(Continued)

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
France																		
1974	$268	100.0%	$ 12	4.5%	$146	54.3%	$ 2	.6%	$34	12.7%	$33	12.3%	$15	5.7%	—	—	$ 3	1.3%
1975	355	100.0	16	4.5	196	55.3	1	.4	41	11.7	52	14.7	19	5.4	—	—	5	1.4
1976	320	100.0	19	5.9	162	50.7	2	.7	43	13.6	41	12.9	18	5.8	—	—	6	1.8
1977	256	100.0	11	4.3	135	52.8	2	.9	33	12.9	38	14.8	17	6.5	—	—	3	1.1
1978	267	100.0	13	5.0	117	43.8	5	1.9	48	17.9	46	17.3	16	5.9	—	—	6	2.2
1979	342	100.0	22	6.5	145	42.5	10	3.0	58	17.0	55	16.0	22	6.4	—	—	6	1.6
1980	494	100.0	23	4.7	196	39.8	31	6.2	63	12.8	95	19.2	38	7.7	—	—	7	1.5
United Kingdom																		
1974	194	100.0	28	14.4	87	44.9	6	3.3	22	13.0	15	7.8	—	—	$10	5.0%	10	5.1
1975	220	100.0	35	16.1	90	40.9	9	4.2	25	11.2	16	7.1	—	—	17	7.8	10	4.5
1976	219	100.0	38	17.5	90	41.2	9	4.1	23	10.7	12	5.3	—	—	11	5.2	14	6.2
1977	223	100.0	27	12.2	90	40.2	12	5.5	27	11.9	19	8.5	—	—	13	6.0	10	4.3
1978	356	100.0	50	14.2	149	41.7	24	6.8	36	10.1	28	7.7	—	—	19	5.3	15	4.1
1979	521	100.0	87	16.7	214	41.1	46	8.9	51	9.7	44	8.5	—	—	33	6.3	20	3.8
1980	499	100.0	67	13.4	188	37.6	69	13.8	47	9.5	50	10.1	—	—	22	4.4	19	3.9
Canada																		
1974	105	100.0	67	64.3	10	9.3	4	4.1	2	1.6	4	3.6	12	11.7	3	2.8	2	1.5
1975	126	100.0	79	62.4	14	11.5	6	4.4	2	2.0	5	3.9	13	10.1	4	2.9	2	1.7
1976	114	100.0	81	71.2	8	7.3	6	5.0	1	.5	4	3.7	9	7.8	2	1.5	2	1.7
1977	109	100.0	63	57.7	13	12.4	7	6.8	2	1.5	6	5.5	10	9.6	2	2.2	2	2.3
1978	136	100.0	82	60.1	15	11.2	9	6.9	2	1.5	10	7.0	10	7.2	4	3.1	3	1.9
1979	180	100.0	105	58.1	19	10.7	14	7.6	2	1.3	13	7.1	16	8.8	4	2.2	5	2.9
1980	283	100.0	170	59.9	30	10.6	30	10.5	4	1.6	13	4.8	25	8.8	4	1.5	4	1.4
Switzerland																		
1974	87	100.0	4	4.8	55	63.2	1	.6	—	—	9	10.0	6	6.9	7	7.8	2	2.2
1975	72	100.0	4	5.8	40	55.5	(c)	.2	—	—	9	12.6	7	9.0	7	9.9	2	2.6
1976	63	100.0	3	4.6	37	58.2	(c)	.4	—	—	8	12.9	8	12.3	3	5.2	1	1.6
1977	82	100.0	3	4.2	50	61.4	1	1.1	—	—	10	11.8	7	8.1	6	6.8	2	2.2
1978	134	100.0	5	3.5	80	59.6	2	1.5	—	—	17	12.9	11	8.1	12	8.6	3	2.0
1979	157	100.0	7	4.5	92	58.5	4	2.7	—	—	19	12.1	8	5.2	12	7.9	3	1.9
1980	229	100.0	14	6.0	122	53.4	12	5.2	—	—	28	12.1	25	10.8	17	7.3	3	1.4

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Japan																		
1974	$147	100.0%	$50	34.1%	$64	43.6%	—	—	$16	11.2%	$ 3	2.0%	$ 6	3.9%	$ 2	1.3%	$2	1.2%
1975	100	100.0	42	42.4	38	37.6	—	—	8	7.6	1	1.0	3	2.9	2	1.7	1	1.2
1976	60	100.0	27	45.7	15	25.7	—	—	11	17.8	1	1.4	2	3.9	2	2.5	(c)	.7
1977	75	100.0	23	30.4	35	47.4	—	—	8	10.3	1	1.8	1	1.6	2	3.1	1	1.9
1978	102	100.0	40	39.1	37	36.2	—	—	15	14.6	1	0.7	2	2.1	1	1.0	2	1.7
1979	153	100.0	51	33.0	65	42.5	—	—	20	12.9	2	1.0	3	2.2	2	1.3	3	1.8
1980	183	100.0	61	33.4	67	36.6	—	—	36	19.5	5	2.9	4	2.4	3	1.4	2	1.2
Developing Countries																		
Brazil																		
1974	203	100.0	38	18.9	98	48.6	$ 14	6.9%	11	5.7	18	9.0	11	5.6	3	1.2	2	1.1
1975	273	100.0	56	20.4	94	27.3	26	6.5	11	2.3	55	7.3	16	5.6	6	2.2	3	.6
1976	236	100.0	88	37.2	74	31.5	18	7.6	8	3.5	20	8.5	15	6.5	6	2.5	2	.7
1977	172	100.0	41	23.7	63	36.8	21	12.1	6	3.8	21	12.0	12	7.0	3	1.7	1	.7
1978	211	100.0	32	15.0	76	36.0	40	18.8	17	7.9	31	14.7	10	4.8	5	2.3	2	1.0
1979	187	100.0	24	13.0	95	50.6	22	11.9	8	4.4	15	7.8	7	3.8	2	1.2	8	4.3
1980	201	100.0	19	9.7	122	60.6	22	10.8	9	4.7	16	7.8	5	2.4	3	1.6	2	1.0
Republic of Korea																		
1974	55	100.0	4	6.5	9	16.1	41	73.0	1	1.2	(c)	(d)	(c)	.7	(c)	.1	(c)	(d)
1975	81	100.0	5	6.3	11	14.1	40	49.3	2	1.9	(c)	.1	9	11.4	12	14.9	(c)	.2
1976	98	100.0	5	5.6	7	7.6	65	67.0	1	1.5	(c)	.2	16	16.0	(c)	.2	(c)	.2
1[illegible]	164	100.0	7	4.2	18	10.9	133	81.1	2	1.4	(c)	.1	2	1.3	1	.6	(c)	.2
19[illegible]	323	100.0	24	7.5	39	12.1	231	71.6	9	2.9	NA	NA	8	2.4	7	2.3	NA	NA
1979	376	100.0	34	9.1	85	22.6	212	56.4	8	2.2	4	1.1	14	3.7	13	3.4	1	0.4
1980	156	100.0	24	15.3	24	15.3	95	60.7	4	2.7	1	0.8	3	1.7	3	1.7	(c)	0.1
Spain																		
1974	128	100.0	6	4.8	60	46.7	2	1.4	13	10.0	13	10.3	7	5.7	18	14.4	2	1.9
1975	174	100.0	28	16.2	71	40.5	1	.5	11	6.0	18	10.5	19	10.7	12	7.0	3	1.8
1976	102	100.0	6	5.7	46	45.0	2	2.1	5	4.8	13	12.9	11	10.6	9	8.8	3	2.6
1977	91	100.0	4	4.7	38	41.4	6	6.4	8	8.6	14	14.9	5	5.[illegible]	10	11.0	1	1.1
1978	89	100.0	4	4.3	37	42.0	3	3.9	6	7.1	16	17.9	4	4.7	15	16.6	1	0.9
1979	95	100.0	5	5.0	42	44.0	2	1.9	5	5.1	22	22.9	5	5.6	12	12.1	1	0.6
1980	102	100.0	14	13.2	31	30.3	3	3.1	6	5.6	17	16.9	10	10.0	16	15.9	1	1.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Venezuela																		
1974	$ 23	100.0%	$ 6	25.4%	$ 6	25.3%	(c)	.5%	(c)	1.4%	$ 7	31.9%	$ 1	2.3%	$ 1	4.0%	(c)	1.9%
1975	45	100.0	12	27.4	8	16.8	(c)	.7	(c)	1.1	17	37.6	2	4.2	3	5.6	$1	1.1
1976	55	100.0	19	35.1	11	19.9	$ 1	1.9	$ 1	1.4	16	28.7	2	4.4	1	2.0	1	1.4
1977	75	100.0	20	27.1	16	21.6	1	1.4	3	4.5	23	31.0	3	4.3	1	1.8	1	1.1
1978	85	100.0	27	31.8	16	18.5	5	5.5	2	2.2	21	24.9	3	3.3	4	4.4	1	1.1
1979	88	100.0	46	52.8	8	9.0	4	4.6	2	1.9	21	23.4	3	3.5	(c)	0.5	(c)	0.5
1980	61	100.0	21	34.5	13	21.7	2	2.9	2	3.0	18	29.6	2	3.3	1	2.0	(c)	0.7
Mexico																		
1974	71	100.0	35	49.5	19	27.1	2	2.3	2	2.3	5	6.4	2	3.2	4	5.1	1	1.0
1975	77	100.0	41	52.7	16	21.0	2	2.4	2	3.1	6	7.2	4	5.6	3	3.8	1	1.1
1976	90	100.0	53	59.3	17	18.4	1	1.1	3	3.0	5	6.1	4	4.8	3	3.6	1	.9
1977	70	100.0	42	60.1	8	10.9	9	12.1	2	2.8	4	6.2	2	3.4	(c)	.5	1	.9
1978	75	100.0	38	50.5	15	20.5	7	9.2	2	3.3	4	5.1	4	4.8	1	0.9	1	1.9
1979	121	100.0	70	58.2	20	16.7	7	5.7	3	2.9	8	6.8	4	3.2	2	1.2	2	1.8
1980	324	100.0	143	44.2	97	30.0	17	5.3	9	2.7	15	4.6	20	6.3	5	1.6	4	1.2
Turkey																		
1974	29	100.0	1	3.4	16	56.1	(c)	.7	2	8.5	5	18.7	1	4.2	1	3.0	(c)	.6
1975	54	100.0	3	5.0	29	54.0	(c)	.9	3	6.2	8	13.9	5	8.4	2	4.2	1	1.0
1976	64	100.0	1	1.6	26	40.1	2	2.4	3	5.0	9	14.2	10	15.5	3	4.7	1	1.0
1977	62	100.0	1	1.0	19	31.0	1	.9	3	5.5	9	14.4	12	19.3	15	23.6	1	1.6
1978	46	100.0	5	10.7	15	33.6	2	5.1	1	1.9	11	23.8	3	6.6	7	15.5	1	1.5
1979	40	100.0	2	3.8	13	31.4	NA	NA	5	12.8	6	15.1	4	9.5	8	19.3	NA	NA
1980	48	100.0	(c)	0.9	16	34.1	1	3.1	3	6.4	5	11.0	3	6.3	15	30.7	NA	NA
India																		
1974	37	100.0	2	5.2	17	45.4	3	7.1	6	17.3	(c)	1.1	4	10.0	3	8.4	(c)	.6
1975	53	100.0	3	5.6	24	46.2	3	4.8	7	13.1	2	3.4	6	11.1	2	3.9	1	1.3
1976	52	100.0	2	4.7	28	52.7	1	2.5	8	14.7	1	1.5	6	10.9	1	1.4	2	3.3
1977	48	100.0	4	8.8	24	49.7	1	2.1	8	15.8	(c)	.8	5	9.8	2	3.7	1	2.7
1978	70	100.0	7	9.9	32	45.6	4	5.2	14	20.6	2	3.0	6	8.0	3	4.0	NA	NA
1979	74	100.0	5	6.1	26	34.5	8	10.8	15	20.8	3	4.4	9	12.1	5	6.8	2	2.2
1980	100	100.0	10	10.2	38	37.5	12	12.3	14	14.0	5	4.8	16	15.9	2	2.1	1	0.9

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Saudi Arabia																		
1974	$ 3	100.0%	(c)	9.5%	$ 1	43.5%	(c)	2.0%	(c)	3.0%	(c)	14.4%	$ 1	17.5%	(c)	5.6%	(c)	.3%
1975	12	100.0	$ 2	16.5	4	38.0	(c)	1.1	(c)	3.8	$ 1	9.9	2	16.2	$ 1	6.6	(c)	3.4
1976	31	100.0	4	11.7	7	23.8	(c)	1.2	$ 1	4.2	5	16.7	5	14.6	6	19.8	$ 2	5.0
1977	45	100.0	8	16.9	15	34.1	$ 1	1.8	2	5.1	7	14.9	2	4.1	9	19.9	1	1.2
1978	33	100.0	9	27.1	8	25.2	3	9.2	2	5.2	6	18.3	2	6.3	1	4.5	(c)	1.3
1979	47	100.0	15	32.7	11	22.5	8	16.3	1	1.8	7	14.2	2	3.9	3	5.6	1	1.2
1980	40	100.0	11	27.4	7	18.7	3	8.6	1	2.7	8	20.0	4	8.9	3	8.0	1	1.8
China																		
1974	50	100.0	--	—	12	24.8	18	36.9	12	24.4	4	7.8	1	1.8	2	3.3	(c)	.4
1975	74	100.0	5	6.4	24	32.1	21	28.5	14	18.7	4	5.9	3	3.5	(c)	.4	1	1.5
1976	61	100.0	2	3.5	15	24.5	22	36.9	15	24.6	3	5.5	2	3.4	1	1.1	(c)	(d)
1977	39	100.0	4	8.9	14	35.6	3	8.4	15	38.4	(c)	.6	(c)	.2	3	6.6	(c)	(d)
1978	68	100.0	6	8.8	20	29.5	15	22.3	12	18.2	2	2.8	1	1.7	NA	NA	NA	NA
1979	112	100.0	NA	NA	34	30.7	30	27.0	24	21.1	3	2.4	4	4.0	NA	NA	NA	NA
1980	132	100.0	7	5.1	40	30.7	27	20.8	14	10.7	10	8.0	5	3.7	NA	NA	NA	NA
Argentina																		
1974	26	100.0	3	13.3	12	45.4	3	.6	3	10.2	3	11.5	2	6.5	2	9.0	(c)	.5
1975	28	100.0	4	15.0	7	23.9	(c)	10.2	1	4.8	7	26.1	2	7.9	1	4.3	1	3.8
1976	25	100.0	4	16.9	10	38.0	3	1.0	2	8.8	6	23.0	1	3.2	1	5.0	(c)	1.3
1977	30	100.0	3	10.8	9	31.1	1	1.7	5	15.3	7	21.7	2	5.2	3	9.0	(c)	1.5
1978	78	100.0	11	14.3	33	42.0	1	1.0	6	8.2	16	20.6	NA	NA	4	5.8	1	1.2
1979	64	100.0	9	13.4	24	37.6	NA	3.0	9	13.6	10	14.9	3	4.1	7	10.4	1	1.7
1980	80	100.0	14	17.7	18	21.8	2	3.0	7	8.4	23	28.0	5	5.9	10	12.7	1	1.2
Eastern Europe																		
U.S.S.R.																		
1974	449	100.0	68	15.2	185	41.2	39	8.6	46	10.2	40	8.9	9	1.9	32	7.1	9	2.1
1975	553	100.0	92	16.6	224	40.5	29	5.2	66	11.9	44	7.9	13	2.3	53	9.5	13	2.4
1976	577	100.0	48	8.3	307	53.2	24	4.1	80	13.8	39	6.7	13	2.3	25	4.3	15	2.5
1977	649	100.0	31	4.8	320	49.2	80	12.4	80	12.4	43	6.6	9	1.3	21	3.2	15	2.3
1978	637	100.0	17	2.6	301	47.3	78	12.3	71	11.1	77	12.0	NA	NA	42	6.7	5	0.8
1979	635	100.0	7	1.1	315	49.6	47	7.3	73	11.5	78	12.3	18	2.8	58	9.1	11	1.7
1980	749	100.0	26	3.4	391	52.2	67	8.9	82	10.9	68	9.1	19	2.6	67	9.0	7	1.0

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Poland																		
1974	$154	100.0%	$ 3	2.1%	$61	39.7%	$ 4	2.4%	$20	13.1%	$25	16.4%	$ 8	5.2%	$11	7.2%	$8	4.9%
1975	167	100.0	8	4.7	42	25.2	2	1.0	27	16.3	21	12.5	24	14.2	19	11.7	6	3.5
1976	205	100.0	13	6.6	56	27.3	17	8.5	26	12.8	15	7.2	15	7.5	35	17.3	8	3.8
1977	203	100.0	8	4.0	54	26.8	41	20.1	25	12.4	21	10.1	21	10.4	12	5.7	6	3.1
1978	264	100.0	25	9.4	81	30.8	26	9.9	27	10.4	22	8.4	52	19.7	10	3.6	7	2.6
1979	187	100.0	3	1.8	56	30.1	NA	NA	17	9.2	16	8.5	34	17.9	8	4.4	3	1.9
1980	114	100.0	2	1.8	38	33.6	6	5.0	17	15.2	15	13.0	14	12.0	16	14.3	3	2.4
Rumania																		
1974	51	100.0	(c)	.8	28	53.9	2	3.1	8	14.7	6	11.9	2	4.1	3	5.1	2	4.7
1975	73	100.0	2	3.2	34	46.1	2	2.5	14	19.4	7	9.3	6	7.6	3	4.0	4	6.1
1976	74	100.0	2	2.2	34	46.2	3	4.2	6	8.4	14	18.6	2	2.2	6	8.1	3	7.4
1977	140	100.0	5	3.4	57	40.7	26	18.8	14	10.1	13	9.1	4	3.1	10	6.9	2	1.2
1978	267	100.0	21	8.0	73	27.1	50	18.8	17	6.3	37	13.7	7	2.5	56	20.9	2	0.6
1979	243	100.0	7	2.7	58	24.1	23	9.4	17	7.1	52	21.5	6	2.3	72	29.7	2	1.0
1980	126	100.0	3	2.7	24	19.2	4	2.8	7	5.8	36	28.8	5	3.6	34	27.3	(c)	0.1
Yugoslavia																		
1974	47	100.0	1	2.0	28	60.0	(c)	13.6	6	13.7	6	1.4	1	5.3	2	.7	(c)	1.2
1975	85	100.0	2	1.8	53	61.9	(c)	(d)	9	10.5	9	11.1	1	1.3	8	9.8	1	.6
1976	68	100.0	2	3.2	39	57.6	NA	NA	11	16.4	6	8.1	2	2.9	5	7.1	2	2.6
1977	87	100.0	2	1.8	57	65.7	NA	NA	11	13.0	8	9.6	3	3.5	3	3.4	1	1.5
1978	143	100.0	5	3.6	83	58.4	NA	NA	22	15.5	15	10.3	5	3.3	6	4.5	3	2.4
1979	186	100.0	5	2.7	98	52.5	8	4.2	22	11.9	24	12.9	2	1.2	14	7.5	(c)	0.5
1980	139	100.0	3	2.2	66	47.6	NA	NA	17	12.1	31	22.4	4	2.8	14	10.1	2	1.3
Czechoslovakia																		
1974	33	100.0	(c)	.2	20	59.6	(c)	.1	8	24.2	1	3.0	1	2.2	1	3.7	1	1.7
1975	51	100.0	(c)	(d)	30	59.2	(c)	.6	7	13.9	2	4.2	1	1.6	2	4.6	1	1.9
1976	57	100.0	(c)	.8	26	44.9	(c)	.2	11	18.8	2	4.2	4	6.4	8	14.5	1	1.1
1977	53	100.0	(c)	.9	34	63.5	2	3.0	8	15.2	3	5.4	1	2.7	1	1.3	(c)	.3
1978	75	100.0	(c)	0.3	49	64.3	NA	NA	12	15.8	6	7.3	2	2.0	2	3.1	1	0.8
1979	82	100.0	NA	NA	54	65.8	1	0.6	17	20.8	3	4.0	1	1.2	1	1.7	3	3.2
1980	78	100.0	NA	NA	44	56.1	NA	NA	11	13.7	11	14.6	3	3.4	4	5.6	(c)	0.2

Note: Footnotes on final page of table.

EXPORT MARKET SHARES OF MAJOR MACHINE TOOL PRODUCER COUNTRIES TO SELECTED LARGEST IMPORTER COUNTRIES (a)

(Values in Millions of Dollars and Percent of Total)

(Continued)

Importing Country and Date	Total Exports from 14 Major Producers (b)		Exporting Country															
			United States		West Germany		Japan		Switzerland		Italy		United Kingdom		France		Sweden	
	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%	Value	%
Hungary																		
1974	$12	100.0%	(c)	.2%	$ 7	53.5%	$1	5.6%	$2	20.3%	(c)	2.3%	(c)	3.2%	$1	4.5%	(c)	.8%
1975	15	100.0	(c)	.4	9	57.8	(c)	(d)	3	22.4	$1	9.4	(c)	2.7	1	4.4	(c)	1.6
1976	27	100.0	(c)	.6	13	48.4	(c)	.1	5	19.2	5	18.5	(c)	1.4	1	2.9	$1	4.4
1977	50	100.0	$2	3.4	32	63.6	3	7.0	5	10.4	1	2.0	$1	1.7	1	1.9	1	1.6
1978	48	100.0	(c)	0.4	26	55.3	1	1.9	7	15.3	4	9.2	1	1.4	2	5.0	NA	NA
1979	62	100.0	1	1.8	44	70.9	NA	NA	6	9.1	3	4.3	NA	NA	2	3.1	1	1.5
1980	41	100.0	NA	NA	22	53.3	NA	NA	7	16.2	3	8.3	1	3.4	2	4.5	(c)	0.9

NA - Not Available.

(a) Re-exported items are included; therefore these figures are inconsistent with other Handbook data.

(b) Percent of Total is proportion of Total Exports from 14 Major Producers. The 14 countries are: United States, Austria, Belgium, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland and the United Kingdom.

(c) Less than $500,000.

(d) Less than .05%.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools for Working Metals.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1983

(Thousands of U.S. Dollars)

Code 84.45	Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
	METAL CUTTING						
01	For fissionable material, NC	$ 71	$ 0	$ 0	$ 0	$ 0	$ 71
03	For fissionable material, not NC	274	0	0	123	149	0
05	Electro erosion, electric, ultrasonic, NC	49,226	23,885	8,800	9,214	2,257	3,440
07	Electro erosion, electric, ultrasonic, not NC	22,613	6,176	7,093	6,523	1,172	925
12	Center and copying multiple tool lathes, NC	64,312	19,564	13,250	4,763	9,534	13,325
14	Automatic and turret lathes, NC	66,872	13,138	16,379	4,983	6,922	23,281
16	Automatic and revolving lathes, not parallel, multiple tool, NC	42,802	7,086	11,570	5,066	3,807	12,932
22	Center and copying lathes, multiple tool, not NC	31,283	10,951	7,069	1,939	4,244	5,410
24	Automatic and turret lathes, not NC	42,109	12,706	10,265	5,003	2,663	10,832
26	Automatic and turret lathes, not parallel, multiple tool, not NC	30,028	8,403	6,017	4,253	7,219	2
36	Boring-milling machines, horizontal, NC	50,725	23,613	5,538	10,651	3,145	6,645
37	Boring machines, not boring-milling, NC	8,031	1,879	3,845	450	994	800
38	Boring-milling, horizontal, not NC	12,197	3,677	3,271	1,180	893	2,453
39	Boring machines, not boring-milling, not NC	7,576	699	2,038	1,793	1,123	1,360
41	Planing machines, NC	239	0	0	2	231	0
43	Planing machines, not NC	709	247	81	31	126	6
44	Shaping & slotting, broaching, sawing, NC	2,905	0	488	709	280	754
45	Shaping & slotting, not NC	3,283	588	266	407	235	1,412
46	Broaching machines, not NC	6,752	2,008	3,248	60	180	1,222
47	Sawing and cut-off machines, not NC	42,698	7,678	9,898	4,592	5,945	8,930
48	Milling machines, NC	78,067	30,316	21,852	3,514	9,679	7,298
49	Radial drilling machines, NC	985	188	11	39	646	73
51	Piercing machines, not drilling, NC	34,748	11,888	11,043	3,460	2,458	4,240
52	Milling machines, not NC	71,895	22,057	15,641	7,434	9,328	11,842
53	Radial drilling machines, not NC	7,665	2,992	2,050	730	1,042	620
54	Other drilling machines	36,012	10,110	10,778	1,804	6,033	4,802
55	Cylindrical and surface grinding machines (micrometric) NC	34,378	5,698	5,022	9,711	3,228	9,745
56	Grinding, honing, polishing, lapping (micrometric), NC	9,603	4,836	1,734	773	815	990
57	Surface grinding machines, plane surface (micrometric), not NC	18,384	2,922	3,486	3,818	2,291	4,748
58	Surface grinding machines, cylindrical surface (micrometric), not NC	35,977	15,739	7,362	2,314	2,094	7,818
59	Other grinding machines, not plane or cylindrical surface, (micrometric), not NC	41,779	11,995	9,780	9,850	2,797	5,932
61	Grinding, honing, polishing, lapping, (micrometric), not NC	25,894	10,797	3,908	2,676	1,766	5,941
62	Grinding, honing, polishing, lapping (not micrometric), NC	3,108	727	1,520	256	141	0
63	Grinding, honing, polishing, lapping (not micrometric), not NC	45,081	9,669	16,192	6,861	6,832	3,263
64	Jig boring & milling machines, NC	56,331	16,467	4,181	1,597	31,423	767
65	Jig boring & milling machines, not NC	4,560	1,623	835	881	701	384
66	Gear cutting machines, cylindrical, NC	3,834	223	1,779	1,096	445	228
68	Gear cutting machines, cylindrical, not NC	7,644	830	1,905	869	2,566	1,348
69	Gear cutting machines, noncylindrical, NC	1,444	165	567	183	121	408
71	Gear cutting machines, noncylindrical, not NC	14,414	6,747	3,133	1,885	2,377	239
93	Screwing and tapping machines by cutting	11,539	1,794	1,545	2,559	1,793	2,939
94	Other metal cutting machines	86,501	3,482	19,757	7,334	2,178	53,076
	Total imports, cutting (EEC)	$1,114,548	$313,563	$253,197	$131,386	$141,873	$220,501

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1983

(Thousands of U.S. Dollars)

(Continued)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL FORMING						
72 Hydraulic presses, NC, other than 8445.81, 82, 88	$ 11,291	$ 1,446	$ 1,861	$ 606	$ 552	$ 5,805
75 Presses, NC, other than 8445.81, 82, 88	8.675	1,320	1,458	1,274	474	2,531
77 Hydraulic presses, not NC, other than 8445.83, 87, 89	28,779	8,512	5,763	2,169	3,766	7,210
78 Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	11,585	5,801	848	1,801	706	1,563
79 Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	46,849	9,436	19,463	7,610	4,525	4,025
81 Rolling, bending, folding and planing machines, NC	14,692	6,437	2,725	964	553	2,296
82 Shearing, punching and stamping, NC	41,045	6,984	11,314	2,602	4,574	11,839
83 Rolling, bending, folding and planing machines, not NC	29,708	13,522	3,727	2,185	3,993	3,925
84 Rolling, bending, folding and planing, not flat products, not NC	25,179	7,043	7,603	1,955	3,510	3,213
85 Hydraulic shearing machines, not NC	18,553	6,002	3,742	766	2,901	3,787
86 Nonhydraulic shearing machines, not NC	15,932	2,516	3,418	1,523	4,070	3,373
87 Punching and stamping machines, not NC	24,903	8,053	4,902	755	6,338	3,168
88 Forging and stamping, NC	5.288	139	969	3,396	337	393
89 Forging and stamping, not NC	8,229	3,208	2,037	1,043	718	830
92 Forming by drawing, bars, tubes, wire etc.	10,170	2,954	606	2,545	1,508	2,499
95 Screwing and tapping machines not by cutting	3,923	1,306	778	534	682	335
96 Other metal forming machines for working flat products	7,325	1,762	2,404	459	1,554	815
97 Other machines for working wire	27,462	5,347	7,941	1,506	2,952	7,152
Total imports, forming (EEC)	$ 339,588	$ 91,788	$ 81,559	$ 33,693	$ 43,713	$ 64,759
98 MACHINE TOOLS NEC	76,190	13,606	17,012	17,006	9,216	8,699
Grand Total	$1,530,326	$418,957	$351,768	$182,085	$194,802	$293,959

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1983

(Thousands of U.S. Dollars)

Code 84.45 Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
METAL CUTTING						
01 For fissionable material, NC	$ 255	$ 0	$ 252	$ 0	$ 3	$ 0
03 For fissionable material, not NC	96	96	0	0	0	0
05 Electro erosion, electric, ultrasonic, NC	15,059	11,414	1,648	317	48	1,632
07 Electro erosion, electric, ultrasonic, not NC	14,862	10,397	474	738	146	3,078
12 Center and copying multiple tool lathes, NC	85,526	61,781	9,612	7,137	5,364	1,632
14 Automatic and turret lathes, NC	129,161	103,987	10,290	3,173	3,093	8,215
16 Automatic and revolving lathes, not parallel, multiple tool, NC	118,276	71,490	1,041	30,428	1,893	13,035
22 Center and copying lathes, multiple tool, not NC	67,973	27,715	6,517	6,610	3,194	23,856
24 Automatic and turret lathes, not NC	97,231	60,786	2,573	15,420	653	17,695
26 Automatic and turret lathes, not parallel, multiple tool, not NC	67,484	33,341	10,750	19,019	3,975	0
36 Boring-milling machines, horizontal, NC	72,233	43,076	855	14,737	8,445	4,912
37 Boring machines, not boring-milling, NC	20,013	13,538	36	1,841	2,428	2,171
38 Boring-milling, horizontal, not NC	14,148	4,885	1,268	3,362	126	3,162
39 Boring machines, not boring-milling, not NC	37,564	21,634	1,450	9,480	164	3,012
41 Planing machines, NC	344	128	24	142	50	0
43 Planing machines, not NC	3,621	2,652	106	460	32	320
44 Shaping & slotting, broaching, sawing, NC	1,365	979	126	94	69	94
45 Shaping & Slotting, not NC	7,473	3,902	672	1,420	86	1,274
46 Broaching machines, not NC	25,402	12,546	953	7,342	26	4,522
47 Sawing and cut-off machines, not NC	85,114	47,095	6,829	20,876	3,174	5,923
48 Milling machines, NC	149,719	108,437	17,579	19,643	367	3,333
49 Radial drilling machines, NC	2,466	188	142	1,956	40	141
51 Piercing machines, not drilling, NC	46,366	20,034	5,985	18,660	259	1,368
52 Milling machines, not NC	183,336	89,107	18,523	35,051	3,170	35,564
53 Radial drilling machines, not NC	7,242	2,499	645	2,953	210	864
54 Other drilling machines	64,430	19,560	8,536	21,851	2,080	10,879
55 Cylindrical and surface grinding machines (micrometric), NC	37,658	20,233	1,739	6,314	188	8,674
56 Grinding, honing, polishing, lapping (micrometric), NC	14,624	12,358	39	1,657	345	151
57 Surface grinding machines, plane surface (micrometric), not NC	81,158	53,111	2,063	12,922	680	8,421
58 Surface grinding machines, cylindrical surface (micrometric), not NC	66,834	36,473	1,860	3,573	1,385	16,948
59 Other grinding machines, not plane or cyclindrical surface, (micrometric), not NC	79,441	28,850	7,064	29,676	3,967	9,144
61 Grinding, honing, polishing, lapping, (micrometric), not NC	155,097	83,669	57,543	6,460	1,389	5,719
62 Grinding, honing, polishing, lapping (not micrometric), NC	1,644	1,374	49	69	99	0
63 Grinding, honing, polishing, lapping (not micrometric), not NC	86,762	45,886	9,614	22,098	5,290	1,673
64 Jig boring & milling machines, NC	50,368	13,043	41	17,170	19,787	0
65 Jig boring & milling machines, not NC	7,545	4,009	93	1,579	165	1,688
66 Gear cutting machines, cylindrical, NC	8,550	8,132	0	79	42	288
68 Gear cutting machines, cylindrical, not NC	27,976	25,327	71	591	83	1,861
69 Gear cutting machines, noncylindrical, NC	151	0	24	53	74	0
71 Gear cutting machines, noncylindrical, not NC	25,072	15,904	4,026	3,020	1,147	970
93 Screwing and tapping machines by cutting	21,537	9,664	2,517	912	1,311	3,038
94 Other metal cutting machines	239,488	179,980	13,961	29,450	53	15,982
Total exports, cutting (EEC)	$2,220,664	$1,309,280	$207,590	$378,333	$ 75,100	$221,239

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1983

(Thousands of U.S. Dollars)

(Continued)

Code 84.45	Item	Total EEC	West Germany	France	Italy	Benelux Countries (a)	United Kingdom
	METAL FORMING						
72	Hydraulic presses, NC, other than 8445.81, 82, 88	$ 18,503	$ 14,548	$ 337	$ 1,734	$ 792	$ 919
75	Presses, NC, other than 8445.81, 82, 88	10,010	4,475	895	2,464	1,446	728
77	Hydraulic presses, not NC, other than 8445.83, 87, 89	106,336	66,194	4,119	7,024	15,826	9,872
78	Nonhydraulic presses, not NC, making rivets, bolts, screws, other than 8445.83, 87, 89	23,953	15,592	1,345	2,108	4,184	724
79	Nonhydraulic presses, not NC, not making rivets, bolts, screws, other than 8445.83, 87, 89	116,541	57,888	11,872	31,002	6,567	8,330
81	Rolling, bending, folding and planing machines, NC	20,505	7,949	1,074	4,024	3,198	2,393
82	Shearing, punching and stamping, NC	55,829	42,967	2,144	4,879	863	4,262
83	Rolling, bending, folding and planing machines, not NC	57,694	29,921	1,920	11,971	7,317	3,591
84	Rolling, bending, folding and planing, not flat products, not NC	67,338	18,888	11,668	15,539	7,688	12,190
85	Hydraulic shearing machines, not NC	34,865	13,216	6,421	1,112	8,483	2,493
86	Nonhydraulic shearing machines, not NC	49,200	23,192	2,807	15,622	875	5,837
87	Punching and stamping machines, not NC	29,156	13,383	3,219	2,120	7,046	2,143
88	Forging and stamping, NC	6,957	5,985	4	225	195	504
89	Forging and stamping, not NC	40,898	31,619	2,511	4,997	720	1,011
92	Forming by drawing, bars, tubes, wire etc.	67,025	48,421	134	8,984	883	8,595
95	Screwing and tapping machines not by cutting	7,703	5,265	473	1,449	289	179
96	Other metal forming machines for working flat products	31,602	26,831	1,107	2,160	447	924
97	Other machines for working wire	50,976	38,906	3,207	4,860	1,517	2,192
	Total exports, forming (EEC)	$ 795,091	$ 465,240	$ 55,257	$122,274	$ 68,336	$ 66,887
98	MACHINE TOOLS NEC	231,085	62,518	32,989	103,926	9,776	20,572
	Grand Total	$3,246,840	$1,837,038	$295,836	$604,533	$153,212	$308,698

(a) Belgium, Luxembourg, Netherlands.

Source: Statistical Office of the European Communities.

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1983
Selected Countries
(Thousands of U.S. Dollars)

Countries	Total EEC	France	Belgium	Netherlands	West Germany	Italy
EUROPE	$1,552,862	$287,386	$82,441	$64,434	$354,024	$157,284
France	105,475	—	9,304	2,418	24,483	15,050
Belgium	43,285	7,539	—	1,124	18,586	2,322
Netherlands	38,362	2,997	7,144	—	14,259	918
West Germany	568,707	119,643	36,576	33,783	—	65,702
Italy	195,288	60,189	11,074	4,483	55,708	—
United Kingdom	76,009	18,952	5,107	3,082	16,180	6,800
Denmark	14,745	1,376	166	1,124	3,406	669
Sweden	49,319	5,511	473	3,269	13,518	4,412
Switzerland	303,117	47,394	5,362	8,909	150,034	43,431
Austria	34,482	3,789	447	1,456	20,333	1,542
Portugal	1,561	111	50	52	222	52
Spain	36,287	8,599	1,705	2,057	10,274	2,958
Other Europe	16,893	594	1,322	257	4,393	2,197
Ireland	6,624	70	1,051	59	1,184	94
Norway	1,992	121	222	49	615	20
Finland	3,394	245	7	102	750	81
Yugoslavia	3,183	149	34	44	1,599	796
Eastern Europe	69,330	10,691	3,713	2,421	22,629	11,230
U.S.S.R.	13,422	2,062	354	174	2,896	4,247
East Germany	13,966	3,219	1,590	1,063	0	3,148
Czechoslovakia	19,485	1,806	1,595	878	7,998	2,110
Hungary	12,079	232	15	36	8,289	764
AFRICA	950	14	12	10	31	16
South Africa	807	0	12	0	6	0
AMERICA	132,231	18,362	4,791	3,863	29,994	15,602
United States	126,940	17,921	4,408	3,724	27,593	15,324
Canada	3,155	387	383	97	298	2
Mexico	428	52	0	0	61	0
Colombia	206	0	0	0	0	206
Venezuela	64	0	0	0	0	0
Brazil	2,160	0	0	0	2,043	31
Argentina	79	0	0	41	0	38
ASIA	257,879	41,903	27,406	7,864	68,671	8,710
Israel	764	74	0	0	491	111
Other Near East	251	0	14	0	0	74
India	1,338	35	23	29	312	30
Singapore	1,861	0	0	270	865	33
South Korea	2,836	0	44	226	1,927	51
Japan	228,461	36,327	26,757	5,891	59,057	7,393
Taiwan	20,155	5,046	569	1,406	5,419	367
AUSTRALIA & OCEANIA	1,143	2	194	10	518	0
Australia	1,070	2	194	10	518	0
TOTAL	$1,972,247(a)	$351,129	$114,849	$76,181	$453,239	$181,961

MACHINE TOOL IMPORTS OF EEC COUNTRIES, 1983

Selected Countries

(Thousand of U.S. Dollars)

Countries	United Kingdom	Denmark	Sweden	Switzerland	Austria	Spain
EUROPE	$194,170	$33,421	$105,051	$102,369	$95,517	$76,766
France	16,205	545	3,361	6,852	3,148	24,109
Belgium	10,425	64	1,016	939	561	707
Netherlands	7,338	791	1,913	1,453	937	612
West Germany	90,448	14,722	53,833	63,035	60,584	30,382
Italy	20,125	3,713	9,550	13,083	7,239	10,125
United Kingdom	—	2,074	12,780	6,810	2,442	1,784
Denmark	2,491	—	3,958	616	344	595
Sweden	11,396	4,975	—	2,073	2,636	1,055
Switzerland	19,828	3,263	8,995	—	10,382	5,519
Austria	3,487	178	1,047	1,826	—	378
Portugal	593	0	0	315	0	167
Spain	5,277	612	2,211	1,594	999	—
Other Europe	4,282	609	2,021	911	243	65
Ireland	2,998	322	15	750	72	9
Norway	429	185	299	32	0	20
Finland	357	35	1,677	97	5	35
Yugoslavia	272	62	30	32	166	0
Eastern Europe	2,275	1,874	4,367	2,861	6,002	1,269
U.S.S.R.	649	321	395	1,181	1,143	1
East Germany	623	529	1,467	535	1,263	530
Czechoslovakia	314	709	1,948	570	943	614
Hungary	36	51	38	394	2,224	0
AFRICA	840	6	0	20	0	0
South Africa	769	0	0	20	0	0
AMERICA	45,411	598	5,625	1,504	3,214	3,268
United States	43,802	598	4,754	1,489	3,203	3,226
Canada	1,072	0	871	14	7	24
Mexico	315	0	0	0	0	0
Colombia	0	0	0	0	0	0
Venezuela	64	0	0	0	0	0
Brazil	62	0	0	1	4	18
Argentina	0	0	0	0	0	0
ASIA	53,300	6,393	18,751	12,386	6,217	6,277
Israel	85	0	0	0	0	2
Other Near East	162	0	0	0	0	0
India	694	2	203	3	7	0
Singapore	673	0	0	0	20	0
South Korea	565	13	0	0	0	9
Japan	46,412	5,985	17,182	11,845	5,423	6,190
Taiwan	4,357	324	1,316	510	767	74
AUSTRALIA & OCEANIA	406	0	0	10	0	3
Australia	341	0	0	10	0	3
TOTAL	$294,127	$40,440	$129,427	$116,289	$104,948	$86,313

(a) The total includes Portugal's total of $23,343.

Note: Individual items may not add to totals due to rounding.

Source: Statistical Office of the European Communities.

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1983

Selected Countries

(Thousands of U.S. Dollars)

Countries	Total EEC	France	Belgium	Netherlands	West Germany	Italy
EUROPE	$2,819,919	$133,060	$67,281	$41,905	$1,374,555	$378,639
France	409,068	—	19,031	3,267	206,123	92,900
Belgium	82,662	7,285	—	5,621	44,379	11,106
Netherlands	70,178	1,805	4,102	—	37,718	5,660
West Germany	328,275	22,287	19,697	14,234	—	58,038
Italy	157,508	14,217	2,837	1,131	77,463	—
United Kingdom	186,059	14,935	7,368	5,974	95,849	18,784
Denmark	32,068	633	235	644	14,916	3,971
Sweden	101,463	3,693	684	1,766	59,582	9,291
Switzerland	103,905	8,715	788	1,515	65,757	14,186
Austria	95,700	1,988	535	1,009	66,082	8,342
Portugal	27,469	1,271	414	267	14,969	4,219
Spain	78,355	20,561	819	570	36,356	10,771
OTHER EUROPE	307,346	12,162	4,373	1,926	154,476	55,441
Norway	29,084	791	978	384	9,016	4,053
Finland	45,661	2,258	411	930	18,497	6,668
Yugoslavia	125,982	3,976	490	36	80,851	10,419
Turkey	70,137	3,388	188	144	35,708	24,413
EASTERN EUROPE	839,863	23,508	6,398	3,982	500,887	85,930
U.S.S.R.	598,878	13,943	4,319	3,315	392,587	64,686
Poland	36,721	597	198	303	16,394	3,961
Czechoslovakia	47,412	227	1,051	21	29,878	2,548
Bulgaria	87,860	389	9	253	43,184	1,836
AFRICA	288,344	48,356	10,085	1,258	100,781	58,275
South Africa	106,581	6,568	456	520	41,489	14,952
AMERICA	598,828	94,131	4,888	6,932	183,814	81,132
United States	358,586	17,085	4,291	5,392	123,507	39,153
Canada	36,790	3,422	369	293	14,308	4,852
Mexico	120,280	69,961	0	804	15,654	12,351
Colombia	6,328	433	10	102	1,288	1,085
Venezuela	13,351	371	0	3	1,965	5,914
Brazil	32,323	332	2	48	17,158	8,788
Argentina	12,676	510	3	21	6,354	5,711
ASIA	627,004	18,033	14,127	5,010	283,129	80,256
Iraq	73,613	2,427	547	0	39,584	5,775
Iran	50,709	74	637	55	32,343	5,951
India	91,717	1,689	2,133	467	49,011	5,602
China	49,087	784	115	2	12,497	5,991
Japan	91,780	1,213	1,718	536	42,804	6,276
Taiwan	34,246	849	1,045	108	14,088	6,586
AUSTRALIA & OCEANIA	30,422	1,721	129	1,629	8,334	5,772
Australia	24,942	1,003	64	1,519	7,450	5,249
TOTAL	$4,372,979(a)	$295,301	$96,609	$56,733	$1,950,614	$604,084

MACHINE TOOL EXPORTS OF EEC COUNTRIES, 1983
Selected Countries
(Thousand of U.S. Dollars)

Countries	United Kingdom	Denmark	Sweden	Switzerland	Austria	Spain
EUROPE	$140,294	$18,957	$79,807	$449,771	$86,347	$49,303
France	23,788	980	5,719	45,435	3,702	8,122
Belgium	5,206	299	808	5,715	216	2,026
Netherlands	4,060	895	2,835	9,566	1,496	2,043
West Germany	26,073	3,568	12,359	142,035	17,611	12,373
Italy	7,014	266	4,876	44,216	2,855	2,633
United Kingdom	—	2,288	10,368	22,439	2,775	5,280
Denmark	2,535	—	5,587	2,940	39	569
Sweden	11,031	4,383	—	7,870	1,060	2,103
Switzerland	6,732	733	1,664	—	2,443	1,372
Austria	2,367	388	2,588	11,403	—	998
Portugal	1,296	50	343	1,505	711	2,422
Spain	2,195	276	909	5,174	725	—
OTHER EUROPE	14,219	4,576	19,179	26,968	4,936	9,088
Norway	1,950	2,000	7,270	1,792	345	506
Finland	1,715	1,475	8,956	2,825	424	1,501
Yugoslavia	722	71	2,258	19,027	2,883	5,250
Turkey	2,531	347	66	1,837	789	725
EASTERN EUROPE	33,776	252	12,573	124,506	47,777	273
U.S.S.R.	14,530	42	10,551	69,876	24,848	182
Poland	5,076	12	1,040	8,110	996	34
Czechoslovakia	124	41	443	11,712	1,308	58
Bulgaria	1,347	0	363	24,275	16,205	0
AFRICA	35,630	1,857	1,799	17,233	3,969	9,101
South Africa	23,853	302	585	11,667	2,944	3,245
AMERICA	80,429	3,666	[illegible]	70,149	27,041	29,470
United States	58,549	2,372	14,077	61,397	24,188	8,573
Canada	7,004	528	1,292	2,906	454	1,363
Mexico	11,777	240	68	1,560	1,064	6,801
Colombia	267	180	79	79	71	2,735
Venezuela	194	51	130	54	18	4,652
Brazil	1,336	57	843	3,055	78	626
Argentina	0	0	480	661	287	78
ASIA	56,127	5,923	14,746	130,416	9,050	10,186
Iraq	908	234	68	21,639	2,280	151
Iran	1,935	1,852	964	5,086	1,399	413
India	14,336	212	1,666	15,020	440	1,140
China	3,774	11	1,846	23,779	17	272
Japan	2,045	160	2,503	34,323	202	0
Taiwan	2,471	37	191	6,625	61	2,187
AUSTRALIA & OCEANIA	6,347	72	813	3,321	908	1,375
Australia	4,436	40	584	2,818	795	985
TOTAL	$318,828	$36,448	$114,341	$670,890	$127,315	$99,435

(a) The total figure includes Portugal's total of $2,382.

Note: Individual items may not add to totals due to rounding.

Source: Statiscal Office of the European Communities.

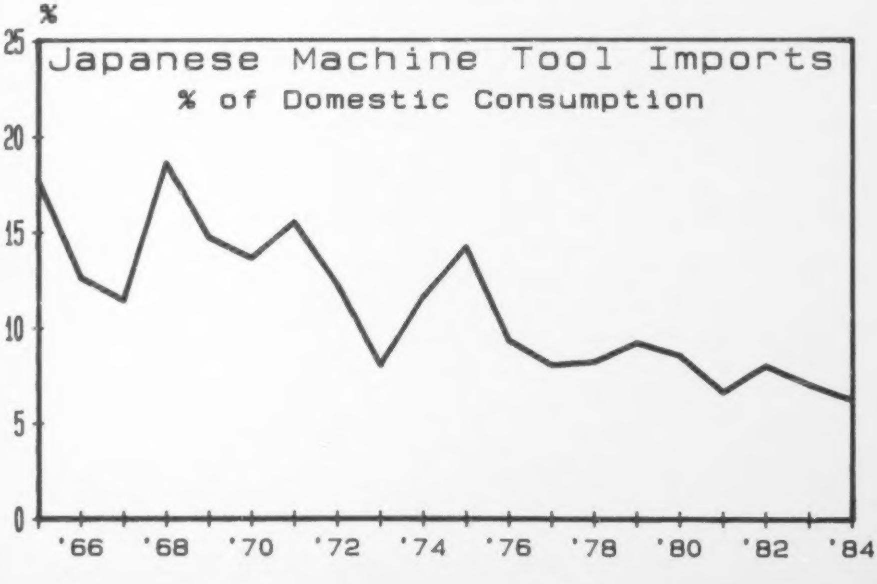
MACHINE TOOL IMPORTS AS A PERCENT OF DOMESTIC MACHINE TOOL CONSUMPTION, 1965 TO DATE

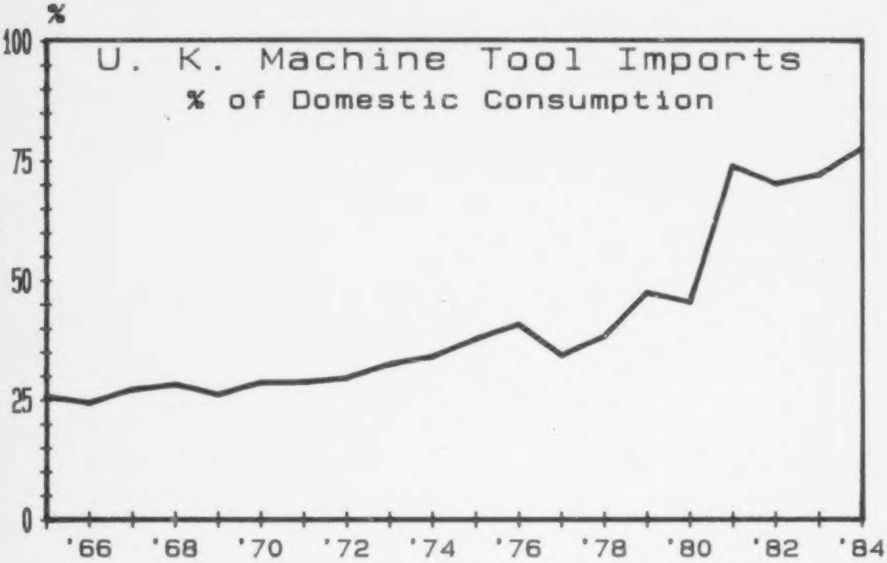
(Percent)

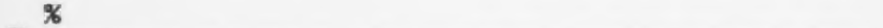
Year	U.S.A.	Japan	United Kingdom	West Germany
1965	4.5%	17.7%	25.7%	17.8%
1966	7.4	12.6	24.3	18.0
1967	10.0	11.4	27.2	16.3
1968	9.8	18.6	28.3	21.4
1969	9.7	14.7	26.0	22.9
1970	9.5	13.6	28.7	23.8
1971	10.1	15.5	28.8	20.6
1972	10.0	12.2	29.6	22.1
1973	10.3	8.0	32.5	21.3
1974	13.4	11.6	34.1	23.7
1975	14.5	14.2	37.7	27.8
1976	16.1	9.3	40.8	27.7
1977	16.5	8.0	34.2	30.0
1978	21.5	8.2	38.3	29.9
1979	23.3	9.2	47.4	29.8
1980	23.6	8.5	45.3	32.8
1981	25.6	6.6	73.9	28.4
1982(r)	27.4	8.0	70.0	25.4
1983(r)	35.3	7.0	72.0	26.7
1984	39.3	6.2	77.5	35.3

r - Revised.

Source: National Machine Tool Builders' Association and respective machine tool trade associations.




%
U. K. Machine Tool Imports
% of Domestic Consumption
100
75
50
25
0
'66
'68
'70
'72
'74
'76
'78
'80
'82
'84



%
German Machine Tool Imports
% of Domestic Consumption
50
40
30
20
10
0
'66
'68
'70
'72
'74
'76
'78
'80
'82
'84

6

THE GERMAN MACHINE TOOL INDUSTRY (a)
1966 to Date

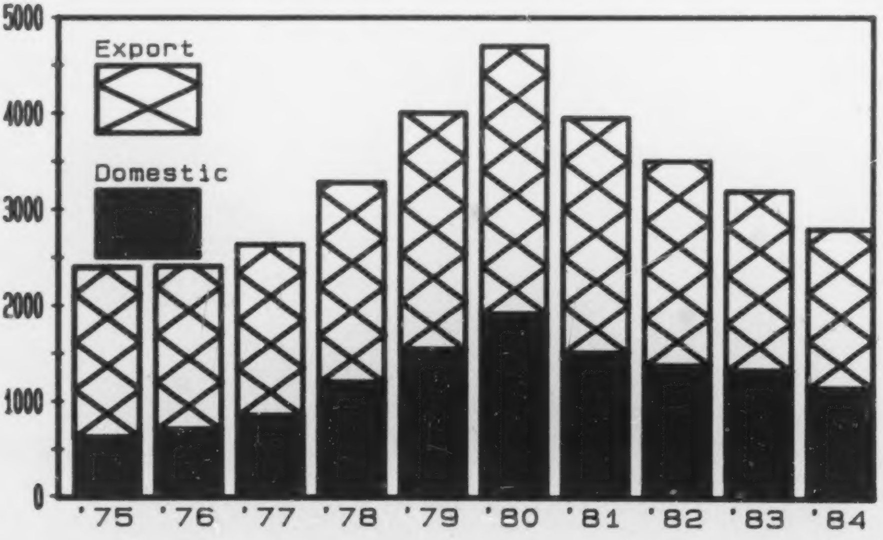
Year	Employees (Year-End)	Per Cent of Production Exported	Imports as Per Cent of Exports	Production Per Employee
		Per Cent of Value		U.S. $
1966	112,500	54.9%	18.0%	$ 7,800
1967	108,000	62.9	11.5	7,943
1968	110,000	68.3	12.6	8,069
1969	120,000	59.1	20.6	9,869
1971	120,000	49.3	26.7	15,370
1972	113,000	55.7	21.2	15,896
1973	112,000	61.3	15.8	19,403
1974	111,500	69.0	12.8	23,411
1975	102,000	72.7	13.0	26,973
1976	96,500	70.2	9.5	28,521
1977	99,000	69.7	18.7	31,456
1978	98,700	65.0	22.9	39,412
1979	100,000	61.9	26.1	48,360
1980	98,000	62.6	29.2	55,497
1981	97,000	65.6	26.0	46,858
1982	93,000	60.7	22.1	43,377
1983(r)	83,700	59.0	23.4	43,989
1984	NA	59.6	28.1	NA

r - Revised. NA - Not Available.

(a) Figures include parts.

Sources: VDMA, "Statistisches Handbuch für den Maschinenbau", annually, "Die Lage des Maschinenbaues im Jahre," annually, and official foreign trade statistics.

West Germany
Machine Tool Production
Millions of Dollars



GERMAN PRODUCTION OF MACHINE TOOLS
1981 to Date
(Values in Thousands of U.S. Dollars)

Machine Classifications	1981		1982		1983		1984	
	Units	Value	Units	Value	Units	Value	Units	Value
GRAND TOTAL	216,778	$4,545,215	184,967	$4,034,050	156,562	$3,681,878	157,054	$3,305,498
Metal Cutting Total	121,471	$3,145,718	89,461	$2,763,248	89,810	$2,557,399	88,475	$2,295,207
Planing, Shaping and Broaching	896	52,257	658	42,134	518	27,430	370	15,940
Lathes	9,969	366,585	7,263	292,209	6,325	289,814	6,477	234,255
Turret Lathes, Automatic	3,801	380,690	2,855	307,676	2.487	288,548	2,652	239,810
Boring and Drilling	18,916	132,359	13,707	111,526	13,297	98,993	12,877	77,426
Milling Machines, Horizontal Boring and Milling Machines	8,568	503,112	6,831	410,129	7,763	376,006	8,341	361,992
Saws and Filing Machines	18,312	103,284	14,761	87,414	18,375	71,478	12,434	63,089
Grinding, Honing and Polishing	45,998	478,880	29,926	447,968	27,931	375,684	30,425	321,534
Gear Cutting Machines	1,337	142,610	1,043	121,130	785	97,280	690	83,571
Other Metal Cutting Machine Tools	13,674	614,377	12,417	605,704	12,329	626,397	14,207	573,545
Parts and Accessories	—	371,566	—	337,358	—	305,769	—	324,043
Metal Forming Total	95,307	1,399,498	95,506	1,270,802	66,752	1,124,479	68,579	1,010,291
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	5,882	150,042	5,425	134,807	3,909	130,647	3,436	96,829
Mechanical Presses	8,203	252,339	9,437	193,607	10,256	157,383	12,077	106,774
Hydraulic Presses	2,095	215,548	2,113	230,467	2,279	215,142	5,517	171,955
Sheet Metalworking Machines, Including Shears	70,999	292,365	71,671	288,854	42,868	248,599	40,699	259,818
Wire Working Machines	7,171	211,965	6,409	198,912	7020	157,783	6,411	147,602
Bolt, Screw and Nut Making Machines	957	57,010	451	30,313	420	32,278	439	49,591
Parts and Accessories	—	220,227	—	191,842	—	182,646	—	177,721

Notes: German Federal Republic includes West Berlin. Totals include some unclassified items.

Exchange Rate: 1981 $1 = 2.260 Deutsche Mark, 1982 $1 = 2.4266 Deutsche Mark, 1983 $1 = 2.5533 Deutsche Mark; 1984 $1 = 2.8459 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Fachgemeinschaft Werkzeugmaschinen, from official foreign trade statistics.

Detailed statistics supplied by individual countries may differ in value figures from those given in the International Statistics on Machine Tools. Problems in the conversion of national currencies into dollars and differing reporting practices probably account for most of the discrepancies.

GERMAN EXPORTS OF MACHINE TOOLS

1982 to Date

(Thousands of U.S. Dollars)

Machine Classifications	1982		1983		1984	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	182,980	$2,587,957	155,030	$2,282,825	184,065	$2,125,073
Metal Cutting Total	152,714	$1,624,741	127,622	$1,473,782	154,490	$1,365,421
Planing, Shaping and Broaching	411	22,644	272	19,208	391	11,435
Lathes	3,941	179,976	2,552	194,120	3,050	158,328
Turret Lathes, Automatic	2,623	183,861	2,200	164,598	2,511	148,959
Drilling	6,522	87,275	5,986	94,404	6,926	69,660
Milling Machines, Horizontal Boring and Milling Machines	5,822	259,878	5,842	245,416	6,934	269,864
Saws and Filing Machines	10,459	61,681	8,382	48,024	9,605	51,650
Grinding, Honing and Polishing	117,637	342,567	98,036	281,654	119,957	267,763
Gear Cutting Machines	610	68,378	514	49,311	590	42,081
Other Metal Cutting Machine Tools	4,689	229,221	3,838	211,281	4,526	175,183
Parts and Accessories	—	189,259	—	165,766	—	170,499
Metal Forming Total	27,324	853,136	24,575	698,258	26,376	605,219
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	3,468	88,347	3,333	73,352	3,074	46,217
Mechanical Presses	3,026	118,971	3,278	62,297	2,970	56,485
Hydraulic Presses	1,347	71,242	2,088	76,362	1,559	53,750
Sheet Metalworking Machines, Including Shears	9,453	177,613	7,299	145,923	8,039	137,905
Wire Working Machines	5,035	150,257	4,165	116,945	5,012	103,721
Bolt, Screw and Nut Making Machines	580	37,612	497	25,130	550	27,844
Other Metal Forming Machine Tools	4,415	49,433	3,915	62,451	5,172	43,642
Parts and Accessories	—	159,660	—	135,798	—	135,654
Other Metal Working Machines (including Parts and Accessories)	2,942	110,080	2,833	110,785	3,199	154,433

Exchange rate: 1982 $1 = 2.4266 Deutsche Mark; 1983 $1 = 2.5533 Deutsche Mark; 1984 $1 = 2.8459 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN IMPORTS OF MACHINE TOOLS
1982 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1982		1983		1984	
	Units	Value	Units	Value	Units	Value
GRAND TOTAL	59,703	$622,904	64,020	$586,445	70,248E	$598,903
Metal Cutting Total	42,217	$415,089	46,445	$371,864	50,915	$375,114
Planing, Shaping and Broaching	108	1,569	103	2,840	153	1,137
Lathes	5,659	60,670	5,369	45,936	5,888	45,711
Turret Lathes, Automatic	683	28,838	587	25,818	1,056	31,188
Drilling	6,287	47,560	5,272	45,711	6,266	51,640
Milling Machines, Horizontal Boring and Milling Machines	4,077	86,192	3,837	79,579	4,097	64,763
Saws and Filing Machines	6,321	9,107	4,820	7,670	6,989	9,438
Grinding, Honing and Polishing	16,432	75,631	22,799	62,318	23,127	61,241
Gear Cutting Machines	66	8,880	57	7,956	61	7,650
Other Metal Cutting Machine Tools	2,584	35,432	3,601	35,384	3,278	39,288
Parts and Accessories	—	61,210	—	58,652	—	63,057
Metal Forming Total	12,028	176,356	13,934	178,749	15,187	179,619
Hammers, Forging and Riveting Machines, Bending and Straightening Machines	1,356	9,841	1,778	11,708	2,101	11,206
Mechanical Presses	1,673	8,305	2,020	10,745	1,315	9,986
Hydraulic Presses	1,056	9,034	1,139	9,123	1,482	13,994
Sheet Metalworking Machines, Including Shears	3,199	38,807	3,963	40,055	4,348	40,666
Wire Working Machines	1,674	26,128	1,784	26,376	2,396	27,396
Bolt, Screw and Nut Making Machines	217	8,036	185	7,923	296	8,775
Other Metal Forming Machine Tools	2,853	15,616	3,065	13,591	3,249	14,725
Parts and Accessories	—	60,590	—	59,228	—	52,871
Other Metal Working Machines (including Parts and Accessories)	5,458	31,459	3,641	35,832	4,146E	44,170

E - Estimate.

Exchange rate: 1982 $1 = 2.4266 Deutsche Mark; 1983 $1 = 2.5533; 1984 $1 = 2.8459 Deutsche Mark.

Note: Individual items may not add to totals due to rounding.

Source: Verein Deutscher Maschinenbau-Anstalten (VDMA) and VDW-Fachgemeinschaft Werkzeugmaschinen.

GERMAN EXPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine & By Destination, 1984
(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$1,194,923	$69,660	$42,081	$267,763	$148,959	$158,328	$269,864	$51,650	$11,435	$175,183
EUROPE	784,471	52,887	22,118	154,875	111,695	99,722	168,322	36,373	8,785	129,694
France	65,179	4,413	1,724	10,775	16,412	7,345	9,470	5,116	876	9,057
Belgium-Luxembourg	26,874	986	1,030	5,039	3,689	6,042	6,004	1,702	145	2,235
Netherlands	36,471	2,540	209	6,618	4,571	4,808	9,338	2,996	181	5,210
Italy	59,398	1,660	2,516	16,247	6,591	3,614	7,300	2,565	246	18,660
United Kingdom	83,991	4,556	3,329	15,090	14,052	12,702	16,487	4,957	41	12,776
Denmark	14,863	1,298	18	1,555	3,545	2,264	3,207	2,000	58	919
Norway	7,073	1,274	15	1,468	455	1,335	668	889	—	969
Sweden	46,288	3,849	888	10,177	6,977	2,804	7,996	2,712	181	10,703
Switzerland	54,448	6,031	2,299	9,228	6,305	6,226	15,121	1,960	30	7,247
Austria	35,295	2,915	918	6,748	3,995	4,359	8,125	1,906	169	6,159
Portugal	5,244	106	119	2,042	153	423	1,285	168	92	857
Spain	14,590	1,428	453	4,627	3,489	684	1,698	447	4	1,760
Yugoslavia	39,538	2,500	902	7,368	5,932	2,756	12,932	523	522	6,103
U.S.S.R.	207,773	6,340	5,566	31,442	29,679	37,032	49,115	4,603	4,721	39,275
Poland	8,197	845	290	3,291	952	1,248	834	341	13	384
Czechoslovakia	17,453	1,792	—	7,066	109	1,037	4,259	997	340	1,852
Hungary	4,069	319	—	1,180	394	329	687	100	—	1,059
Romania	1,603	—	—	480	—	5	1,106	11	—	—
Bulgaria	20,876	4,259	313	6,429	570	2,388	5,804	107	28	978
AFRICA	34,900	2,046	496	7,003	2,654	9,202	4,818	2,224	223	6,234
South Africa	16,741	755	268	3,011	1,148	4,186	3,400	1,609	23	2,340
AMERICA	179,527	7,491	10,274	52,168	21,101	15,651	41,208	6,076	777	24,781
United States	144,952	5,029	9,818	42,766	15,561	10,757	33,876	4,722	349	22,075
Canada	9,181	737	232	3,058	883	2,026	1,072	949	1	223
Mexico	12,663	612	39	3,548	2,292	1,676	3,263	60	392	781
Venezuela	1,850	34	—	79	3	487	223	66	—	959
Brazil	5,832	474	153	1,797	1,960	145	691	124	—	488
Chile	223	11	22	109	—	46	29	6	—	1
Argentina	3,844	576	9	609	398	389	1,791	16	35	22
ASIA	189,667	6,868	8,774	51,831	13,274	33,398	54,949	4,711	1,609	14,253
Iraq	10,065	6	92	146	—	8,227	258	169	—	1,167
Israel	8,586	234	259	1,241	1,753	420	3,409	347	14	909
Other Near East	45,729	2,011	1,721	7,430	3,456	3,341	21,594	1,565	1,084	3,527
India	31,744	617	1,493	7,896	3,150	9,060	6,881	389	21	2,236
Indonesia	4,905	336	—	1,964	62	138	1,681	221	89	413
Singapore	4,629	1,124	164	1,223	648	376	805	224	—	64
China	14,495	707	254	5,883	450	1,585	2,725	26	—	2,866
Japan	23,662	293	4,165	15,491	826	168	762	1,441	—	516
Taiwan	6,725	619	122	1,737	222	369	3,096	45	—	515
AUSTRALIA & OCEANIA	6,359	368	420	1,885	235	355	567	2,267	41	221
Australia	5,463	337	412	1,471	209	320	426	2,116	27	145

Exchange Rate: $1 = 2.8459 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN EXPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1984

(Thousands of U.S. Dollars)

Country of Destination	Total (a)	Hammers, Forging & Riveting, Bending, & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines
TOTAL	$469,565	$46,217	$56,485	$53,750	$137,905	$103,721	$27,844	$43,642
EUROPE	276,425	28,758	33,197	29,359	86,762	55,675	13,894	28,781
France	35,407	1,376	8,938	1,271	12,526	5,956	2,791	2,549
Belgium-Luxembourg	11,135	658	1,533	251	4,034	3,802	173	683
Netherlands	17,693	1,374	3,725	2,713	6,527	2,252	110	992
Italy	22,302	3,604	1,842	2,890	5,101	3,362	1,606	3,897
United Kingdom	28,124	783	3,245	1,416	9,960	8,995	881	2,843
Denmark	4,517	209	222	374	2,265	840	97	509
Norway	5,073	276	989	267	2,387	986	8	159
Sweden	8,166	692	386	97	3,541	2,078	286	1,086
Switzerland	21,239	1,165	1,386	2,403	7,318	5,839	1,854	1,275
Austria	21,462	2,399	3,795	1,782	7,260	3,138	825	2,263
Portugal	1,607	106	162	49	260	687	22	321
Spain	6,837	1,012	642	273	1,590	1,803	148	1,369
Yugoslavia	20,821	726	747	10,926	3,101	1,470	2,937	914
U.S.S.R.	36,117	11,906	1,695	1,088	11,085	2,834	954	6,556
Poland	3,656	214	442	1	356	2,340	23	280
Czechoslovakia	7,130	446	1,678	32	2,715	2,113	—	145
Hungary	4,502	82	465	634	1,167	568	—	1,586
Romania	6	—	—	—	—	6	—	—
Bulgaria	3,062	13	6	317	1,449	778	236	262
AFRICA	34,089	1,394	2,943	3,401	8,592	13,139	1,216	3,404
South Africa	10,575	401	1,156	1,339	3,549	2,730	605	794
AMERICA	73,054	3,985	10,613	5,886	24,914	18,131	3,433	6,092
United States	52,935	2,297	6,930	1,807	22,291	12,676	2,885	4,050
Canada	10,072	811	2,729	3,353	259	1,844	40	1,035
Mexico	1,512	412	70	134	89	534	140	132
Venezuela	1,558	421	219	59	763	87	—	8
Brazil	1,940	—	—	202	370	868	98	402
Chile	738	4	174	—	165	360	6	29
Argentina	1,796	—	450	240	461	347	237	62
ASIA	79,903	11,522	9,411	13,360	16,222	15,478	9,155	4,753
Iraq	598	52	39	—	254	80	59	114
Israel	3,724	179	855	1,014	376	741	257	302
Other Near East	33,873	6,350	5,637	8,137	7,046	3,578	2,229	896
India	10,654	498	518	2,046	1,911	2,146	2,570	965
Indonesia	2,055	116	4	2	609	1,108	16	200
Singapore	2,346	311	222	85	631	659	12	426
China	3,640	544	4	155	574	1,434	896	33
Japan	12,774	2,081	1,350	975	930	3,579	2,822	1,038
Taiwan	1,765	9	—	76	1,003	648	—	30
AUSTRALIA & OCEANIA	6,094	558	321	1,744	1,415	1,298	145	613
Australia	5,252	527	222	1,738	1,232	1,057	84	393

Exchange Rate: $1 = 2.8459 Deutsche Mark.

(a) Includes other metalworking machines.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine & By Destination, 1984
(Thousands of Dollars)

Destination	Total (a)	Drilling Machines	Gear Cutting	Grinding, Honing, Polishing	Turret Lathes, Automatic	All Other Lathes	Boring & Milling Machines	Saw & Filing Machines	Planing, Slotting & Broaching	Other Metal Cutting
TOTAL	$312,057	$51,640	$7,650	$61,241	$31,188	$45,711	$64,763	$9,438	$1,137	$39,288
EUROPE	228,866	29,577	4,677	56,266	24,408	28,551	54,357	6,424	1,078	23,529
France	12,522	779	378	1,712	4,047	1,002	3,025	650	137	792
Belgium-Luxembourg	6,446	2,942	395	289	168	1,471	775	139	56	212
Netherlands	4,082	640	4	1,653	281	532	518	304	48	103
Italy	28,304	3,075	110	8,733	3,218	2,406	7,766	2,044	267	686
United Kingdom	16,016	5,625	184	2,675	1,303	1,605	3,233	348	27	1,015
Denmark	1,073	136	—	551	113	143	33	55	—	41
Sweden	11,616	514	78	8,426	1,266	603	503	39	122	64
Switzerland	108,932	13,930	3,519	26,450	9,120	8,648	26,471	1,208	54	19,521
Austria	13,361	270	—	3,345	1,682	6,136	1,106	736	5	79
Spain	9,856	554	—	442	1,485	1,174	5,289	391	124	398
Yugoslavia	1,776	8	—	664	575	59	456	13	—	—
U.S.S.R.	2,433	221	—	570	—	557	905	—	156	24
Poland	1,058	44	—	66	—	452	442	55	—	—
Czechoslovakia	4,979	301	8	398	956	921	2,394	—	—	—
Hungary	2,883	354	—	129	182	1,400	818	—	—	—
Romania	869	—	—	53	—	110	206	428	72	—
Other Europe	2,662	183	—	110	13	1,333	417	12	—	593
United States	10,088	1,315	2,973	2,315	509	145	306	373	3	2,149
Japan	62,412	16,946	—	671	5,403	13,779	9,579	2,477	56	13,501
All Other Countries	10,690	3,802	—	1,988	869	3,237	521	164	—	109

Exchange Rate: $1 = 2.8459 Deutsche Mark.

(a) Excludes parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

GERMAN IMPORTS OF METAL FORMING MACHINE TOOLS

By Type of Machine & By Destination, 1984

(Thousands of U.S. Dollars)

Origin	Total (a)	Hammers, Forging & Riveting, Bending & Forming	Mechanical Presses	Hydraulic Presses	Sheet Metal-working, Including Shears	Wire Working Machines	Bolt, Screw & Nut Working	Other Metal Forming Machines	Other Metal Working Machines
TOTAL	$126,749	$11,206	$9,986	$13,994	$40,666	$27,396	$8,776	$14,725	NA
EUROPE	105,009	10,588	8,006	13,462	33,542	19,843	5,225	14,343	NA
France	9,635	920	493	2,117	2,774	1,274	262	1,796	NA
Belgium-Luxembourg	6,783	660	819	1,422	2,302	616	693	271	NA
Netherlands	6,952	1,174	253	918	3,571	578	180	277	NA
Italy	18,706	1,894	2,594	934	4,242	2,579	2,028	4,434	NA
United Kingdom	4,378	128	399	671	912	1,352	64	851	NA
Denmark	2,056	234	231	386	1,019	133	3	51	NA
Sweden	4,324	154	72	2,397	561	728	—	412	NA
Switzerland	37,039	2,440	2,123	3,668	16,353	6,793	1,811	3,851	NA
Austria	7,100	1,787	137	352	810	2,176	4	1,835	NA
Spain	4,690	351	313	333	423	2,980	180	111	NA
Yugoslavia	256	—	140	46	1	62	—	7	NA
U.S.S.R.	225	31	144	15	35	—	—	—	NA
Poland	82	—	—	18	—	64	—	—	NA
Czechoslovakia	1,052	761	221	—	70	—	—	—	NA
Hungary	636	—	65	—	149	348	—	75	NA
Romania	—	—	—	—	—	—	—	—	NA
Other Europe	1,096	54	2	183	321	160	—	375	NA
United States	12,135	485	1,496	515	2,435	5,896	1,132	176	NA
Japan	8,436	3	484	15	4,350	1,209	2,194	180	NA
All Other Countries	1,169	130	—	2	338	448	224	27	NA

NA - Not Available. Exchange Rate: $1 = 2.8459 Deutsche Mark.

(a) Totals for individual countries exclude other metalworking machinery and exclude parts.

Note: Individual items may not add to totals due to rounding.

Source: VDW-Fachgemeinschaft Werkzeugmaschinen and VDMA.

JAPANESE PRODUCTION, IMPORTS, EXPORTS, AND DOMESTIC CONSUMPTION OF METAL CUTTING MACHINE TOOLS, 1965 to Date

(Millions of U.S. Dollars)

Year	Production	Imports	Exports	Domestic Consumption
1965	$ 195.4	$ 38.8	$ 24.8	$ 209.4
1966	212.4	21.1	40.6	192.9
1967	350.1	35.7	49.0	336.8
1968	488.9	94.9	51.6	532.2
1969	666.6	95.8	60.4	702.0
1970	867.6	122.7	66.9	923.4
1971	750.5	113.6	80.1	783.2
1972	675.6	74.1	90.8	658.9
1973	1,117.0	78.3	129.3	1,066.0
1974	1,230.2	127.6	197.8	1,160.0
1975	774.9	72.7	207.6	640.0
1976	764.3	46.8	256.5	554.6
1977	1,165.1	58.5	430.1	793.5
1978	1,738.7	93.3	770.4	1,061.6
1979	2,208.9	119.6	942.8	1,385.7
1980	3,012.3	168.6	1,188.9	1,992.0
1981	3,860.3	175.1	1,409.2	2,626.3
1982	3,141.5	175.0	994.1	2,322.4
1983	2,953.6	136.9	999.7	2,090.8
1984(p)	3,709.6	123.2	1,319.9	2,512.9

p - Preliminary.

Exchange rate: 1965-1970 $1 = 360 Yen; 1971 $1 = 350 Yen; 1972 $1 = 302 Yen; 1973 $1 = 272.5 Yen; 1974 $1 = 291.51 Yen; 1975 $1 = 296.8 Yen; 1976 $1 = 296.55 Yen; 1977 $1 = 268.51 Yen; 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52; 1984 $1 = 237.52 Yen.

Sources: Japan, Ministry of International Trade and Industry, and Ministry of Finance.

JAPANESE PRODUCTION, IMPORTS, AND EXPORTS OF METAL FORMING MACHINE TOOLS, 1966 to Date

(Values in Millions of U.S. Dollars)

	Production		Total Exports	Total Imports
Year	Units	Value	Value	
1966	17,229	$ 60.1	$ 12.0	$ 10.6
1967	17,571	106.2	9.1	15.4
1968	21,905	160.8	12.9	38.9
1969	23,033	195.8	18.3	39.4
1970	26,345	241.5	24.3	37.5
1971	16,466	202.0	34.3	40.6
1972	19,720	216.3	54.9	29.2
1973	27,168	360.1	86.4	31.6
1974	23,854	420.0	109.8	48.6
1975	12,447	284.8	105.6	51.3
1976	15,978	294.6	113.4	24.1
1977	16,326	438.0	186.0	27.5
1978	18,526	613.7	241.1	26.8
1979	23,995	687.1	286.6	45.0
1980	28,598	818.0	264.0	52.5
1981	27,961	936.8	276.3	40.4
1982	20,443	653.3	269.3	45.3
1983(r)	21,895	588.2	254.3	34.1
1984	31,719	765.0	421.1	58.6

r - Revised

Source: Japan Metal Forming Machinery Builders' Association

JAPANESE EMPLOYMENT IN THE METAL CUTTING MACHINE TOOL INDUSTRY
Number of Employees, 1964 to Date

Year	Employees	Year	Employees
1964	38,626	1975	40,925
1965	37,377	1976	34,509
1966	33,719	1977	32,168
1967	35,141	1978	28,154
1968	40,092	1979	31,113
1969	44,806	1980	33,737
1970	49,161	1981	33,420
1971	50,630	1982	34,204
1972	46,738	1983(r)	33,705
1973	45,242	1984	33,628
1974	45,295		

r - Revised.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE PRODUCTION, EXPORTS, AND IMPORTS OF METAL FORMING MACHINE TOOLS
By Type of Machine, 1983 and 1984
(Values in Thousands of U.S. Dollars)

	1983(r)			1984		
Type of Machine	Production	Exports	Imports	Production	Exports	Imports
Total						
Units	21,895	28,644	2,380	31,719	32,788	3,305
Value	$588,165	$254,294	$34,102	$762,071	$421,110	$58,639
Hydraulic Presses						
Units	6,959	1,619	54	9,145	2,127	67
Value	$139,020	$ 43,681	$ 4,071	$133,298	$ 58,879	$ 3,625
Mechanical Presses						
Units	8,399	1,986	395	12,206	2,434	773
Value	$305,848	$ 45,230	$ 6,900	$431,850	$113,889	$16,954
Forging & Stamping Machines						
Units	302	320	14	844	398	25
Value	$ 19,868(a)	$ 24,886	$ 3,650	$ 34,549(a)	$ 28,924	$ 5,267
Shearing Machines						
Units	4,492	7,785	284	6,290	7,711	468
Value	$ 63,313	$ 51,280	$ 4,648	$ 79,412	$ 82,065	$ 5,835
Bending Machines						
Units	774	4,590	170	1,539	3,807	209
Value	$ 24,310	$ 28,983	$ 3,132	$ 24,975	$ 37,487	$ 9,010
Wire Forming Machines						
Units	969	193	7	1,695	306	11
Value	$ 35,808	$ 5,389	$ 598	$ 57,987	$ 9,814	$ 396
Other Metal Forming Machines						
Units	—	12,151	1,456	—	16,005	1,752
Value	—	$ 54,845	$11,102	—	$ 90,051	$17,552

r - Revised. Exchange rate: 1983 $1 = 237.52 Yen; 1984 $1 = 237.52 Yen.

(a) Does not include Stamping.

Source: Japan Metal Forming Machinery Builders' Association.

JAPANESE PRODUCTION, EXPORTS AND IMPORTS OF METAL CUTTING MACHINE TOOLS

By Type of Machine, 1984

(Values in Thousands of U.S. Dollars)

	Production		Exports		Imports	
	Units	Value	Units	Value	Units	Value
TOTAL, (incl. NC)	172,887	$3,709,612	364,480	$1,319,901	18,811	$123,185
Horizontal Boring Machines	133	14,083	149	9,027	17	1,040
Jig Boring Machines	971	33,227	49	4,290	18	2,227
Boring Machines, NC	215	43,499	63	16,946	5	1,330
Boring Machines, N.E.C.	427	6,033	279	7,220	17	905
Radial Drilling Machines	1,012	12,113	268	4,265	—	—
Multi-Spindle Drilling Machines	611	12,146	173	5,179	—	—
Bench Drilling Machines	33,147	11,443	6,686	2,185	—	—
Drilling Machines, NC	631	20,470	358	28,701	48	2,421
Drilling Machines, N.E.C.	4,077	17,224	1,420	3,987	6,189	1,305
Gear Hobbing Machines	478	22,011	113	5,536	183	15,275
Gear Cutting Machines, N.E.C.	202	13,047	67	1,427		
Gear Finishing Machines	250	13,889	58	4,042		
Cylindrical Grinding Machines	1,693	68,483	202	10,605	149	6,244
Internal Grinding Machines	867	62,567	119	8,235	37	2,063
Surface Grinding Machines	6,897	107,347	1,464	17,220	1,151	15,018
Centerless Grinding Machines	871	46,063	202	12,433	—	—
Tool Grinding Machines (Universal)	1,335	20,167	205	1,474	—	—
Grinding Machines, NC	674	49,575	176	23,552	133	12,353
Grinding Machines, N.E.C.	1,076	66,053	15,232	40,144	3,333	19,295
Center Lathes	5,092	54,884	1,223	14,348	1,448	7,048
Automatic Lathes	6,734	107,321	717	17,384	132	3,819
Vertical Lathes, NC	380	47,057	6,012	374,613	13	842
Horizontal Lathes, NC	16,170	764,458				
Lathes, N.E.C.	3,079	44,876	1,303	16,045	233	5,465
Knee Type Milling Machines	5,084	73,236	335	5,957	370	2,665
Bed Type Milling Machines	1,723	40,068	—	—	—	—
Copy Milling Machines	657	16,487	187	4,416	352	324
Milling Machines, NC	2,775	146,779	484	63,203	21	2,029
Milling Machines, N.E.C.	481	8,151	2,553	11,856	939	2,808
Machining Centers, Vertical	6,589	452,871	4,668	439,062	—	—
Machining Centers, Horizontal	2,567	321,122			—	—
Machining Centers, N.E.C.	1,096	123,000			—	—
Electrical Discharge Machines, NC	5,034	314,858	—	—	60	5,907
Electrical Discharge Machines, N.E.C.	569	20,322	—	—	—	—
Special Purpose Machines, NC	1,193	129,383	—	—	—	—
Special Purpose Machines, N.E.C.	2,916	191,394	—	—	—	—
Other Metal Cutting Machines, NC	700	69,813	—	—	43	2,282
All Other Metal Cutting Machines, N.E.C.	54,481	144,089	319,715	166,550	1,920	10,521

Exchange rate: $1 = 237.52 Yen.

Sources: Japan, Ministry of International Trade and Industry and Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine, For Selected Destinations, 1984
(Values in Thousands of U.S. Dollars)

	Destination									
Type of Machine	U.S.A.	West Germany	Belgium	United Kingdom	Israel	U.S.S.R.	Korea	Taiwan	India	Singapore
GRAND TOTAL										
Units	189,778	3,516	1,646	6,179	30,307	442	1,886	11,150	549	11,789
Value	$601,436	$66,618	$37,231	$51,983	$37,260	$45,158	$69,224	$51,410	$33,782	$32,780
Boring Machines										
Units	80	1	—	3	29	30	35	39	24	23
Value	$ 8,795	$ 122	—	$ 392	$ 2,467	$ 2,989	$ 2,980	$ 2,240	$ 2,400	$ 1,120
Drilling Machines										
Units	1,464	394	78	331	412	23	391	516	93	906
Value	$ 8,669	$ 543	$ 63	$ 219	$ 5,482	$ 8,858	$ 4,429	$ 3,048	$ 307	$ 1,899
Gear Cutting & Finishing										
Units	21	—	—	—	—	30	32	36	6	5
Value	$ 712	—	—	—	—	$ 1,107	$ 2,387	$ 1,040	$ 505	$ 46
Grinding Machines										
Units	3,711	60	10	1,342	534	166	431	450	142	1,098
Value	$ 27,581	$ 939	$ 4	$ 2,509	$ 341	$ 8,029	$12,900	$10,227	$ 6,311	$ 7,620
Lathes										
Units	3,455	1,124	310	588	169	52	243	352	121	248
Value	$198,606	$22,470	$16,807	$23,653	$ 8,707	$ 5,334	$18,078	$ 9,102	$ 9,435	$10,311
Milling Machines										
Units	2,656	20	—	74	123	29	128	169	17	68
Value	$ 33,294	$ 623	—	$ 2,370	$ 1,612	$ 1,916	$12,382	$ 7,641	$ 2,349	$ 2,429
Planing Machines										
Units	—	—	—	—	—	—	—	6	—	—
Value	—	—	—	—	—	—	—	$ 754	—	—
Machining Centers										
Units	2,858	310	242	166	116	60	26	55	62	71
Value	$254,366	$24,347	$20,234	$15,729	$13,641	$12,125	$ 5,326	$ 7,389	$11,237	$ 6,197
Other Metal Cutting Machines										
Units	175,533	1,607	1,006	3,675	28,924	52	600	9,527	84	9,367
Value	$ 69,409	$17,573	$ 122	$ 7,111	$ 5,010	$ 4,791	$10,736	$ 9,970	$ 1,238	$ 3,153

Exchange Rate: $1 = 237.52 Yen.

Individual items may not add to totals due to rounding.

Source: Japan, Ministry of Finance.

JAPANESE PRODUCTION OF NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1978 to Date

(Values in Thousands of U.S. Dollars)

Type of Machine	1978	1979	1980	1981	1982	1983	1984
GRAND TOTAL							
Units	7,336	14,317	22,069	25,926	24,048	26,398	38,024
Value	$510,463	$937,423	$1,496,512	$1,967,642	$1,687,203	$1,794,548	$2,482,886
Boring Machines							
Units	49	52	103	135	134	140	215
Value	$ 18,772	$ 17,293	$ 35,652	$ 57,298	$ 44,529	$ 42,236	$ 43,499
Drilling Machines							
Units	230	143	249	301	201	501	631
Value	$ 10,952	$ 6,055	$ 8,710	$ 9,781	$ 7,380	$ 17,817	$ 20,470
Milling Machines							
Units	549	979	1,451	2,381	2,308	2,467	2,775
Value	$ 39,920	$ 61,026	$ 83,215	$ 138,430	$ 134,403	$ 141,824	$ 146,779
Grinding Machines							
Units	21	93	154	235	296	338	674
Value	$ 2,523	$ 7,401	$ 15,078	$ 19,653	$ 24,035	$ 24,225	$ 49,575
Lathes							
Units	4,986	8,203	12,036	12,134	10,298	10,020	16,550
Value	$274,918	$448,602	$ 672,891	$ 731,755	$ 560,823	$ 511,309	$ 811,515
Special Machines							
Units	33	62	101	103	137	497	1,193
Value	$ 8,567	$ 18,123	$ 28,370	$ 53,149	$ 39,795	$ 62,799	$ 129,383
Elec. Discharge Machines							
Units	NA	1,583	2,554	3,020	3,522	4,187	5,034
Value	NA	$ 80,298	$ 143,541	$ 180,846	$ 196,932	$ 254,130	$ 314,858
Machining Centers							
Units	1,371	2,927	5,231	7,393	6,936	7,833	10,252
Value	$149,323	$277,935	$ 491,383	$ 749,644	$ 649,219	$ 702,913	$ 896,994
Other NC Metal Cutting Machines							
Units	97	265	190	224	216	415	700
Value	$ 5,486	$ 20,692	$ 17,671	$ 27,085	$ 30,086	$ 37,294	$ 69,813

NA - Not Available.

Exchange rate: 1978 $1 = 210.47 Yen; 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen; $1 1984 = 237.52 Yen.

Source: Japan, Ministry of International Trade and Industry.

JAPANESE TRADE WITH THE UNITED STATES NUMERICALLY CONTROLLED METAL CUTTING MACHINE TOOLS

By Type of Machine, 1984

(Values in Thousands of U.S. Dollars)

	Exports to U.S.		Imports from U.S.	
Type of Machine	Units	Value	Units	Value
Boring Machines	30	$ 4,846	—	—
Drilling Machines	183	6,884	2	$ 177
Grinding Machines	72	9,982	26	4,943
Lathes	3,201	192,106	—	—
Milling	240	29,294	3	741
Machines Centers	2,858	254,366	—	—
Other	—	—	29	1,406

Exchange Rate: $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS
Selected Destinations, 1982 to Date
(Values in Thousands of U.S. Dollars)

	1982		1983		1984	
Destination	Units	Value	Units	Value	Units	Value
TOTAL EXPORTS	218,823	$994,082	296,306	$999,684	36[illegible],480	$1,319,901
North & South America						
Brazil	251	$ 14,302	70	$ 10,197	141	$ 2,964
Canada	13,119	12,857	23,408	13,889	26,206	22,348
Mexico	300	48,332	157	1,958	253	26,166
U.S.A.	62,208	446,220	132,375	364,517	189,778	601,436
Western Europe						
Belgium	3,279	24,862	737	39,112	1,646	37,231
France	4,684	19,016	4,935	15,136	2,727	13,557
Netherlands	1,103	5,413	2,422	5,338	1,328	7,267
Norway	457	3,228	475	1,857	482	2,631
Sweden	795	12,572	1,347	14,268	987	16,891
United Kingdom	4,548	43,907	7,271	38,056	6,179	51,983
West Germany	2,889	47,649	3,927	53,920	3,516	66,618
Eastern Europe						
Poland	—	—	9	1,183	8	1,124
Romania	1	56	—	—	—	—
U.S.S.R.	618	42,851	579	69,880	442	45,158
Asia						
Burma	86	827	168	530	160	480
Korean Republic	1,274	25,553	2,154	93,007	1,886	69,224
People's Republic of	368	5,967	605	5,894	3,857	16,146
Philippines	2,028	4,975	1,660	1,895	371	1,692
Singapore	7,344	26,898	11,347	20,912	11,786	32,780
Taiwan	7,644	36,362	9,487	38,102	11,150	51,410
Thailand	5,699	6,075	7,031	6,450	5,438	24,217
All Other Countries						
Australia	21,215	37,723	17,669	15,893	30,307	37,264
South Africa	2,936	12,495	5,711	12,003	6,056	17,055
All Other Countries	75,977	115,942	62,762	175,686	59,776	174,259

Exchange rate: 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen; 1984 $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE EXPORTS OF METAL CUTTING MACHINE TOOLS TO THE U.S.
1979-1984
(Values in Thousands of U.S. Dollars, F.O.B. Japan)

	Total	Lathes	Drilling Machines	Boring Machines	Milling Machines	Grinding Machines	Other
1979							
Units	72,169	3,477	906	191	5,083	1,045	61,467
Value	$321,426	$181,813	$6,123	$17,726	$11,731	$16,905	$ 87,129
1980							
Units	54,228	4,109	1,053	210	3,426	1,843	43,587
Value	$471,131	$232,110	$8,983	$22,046	$26,430	$29,019	$152,543
1981							
Units	137,009	4,675	1,427	203	859	3,205	126,640
Value	$691,099	$337,151	$7,831	$20,528	$38,253	$27,865	$259,470
1982							
Units	62,208	2,799	1,007	96	1,877	3,213	53,216
Value	$446,220	$196,149	$3,839	$15,844	$16,398	$25,220	$188,769
1983							
Units	132,375	1,981	800	34	1,750	2,196	125,614
Value	$364,517	$120,167	$5,978	$ 4,555	$10,172	$13,691	$209,953
1984							
Units	189,778	3,455	1,464	80	2,656	3,711	178,412
Value	$601,436	$198,606	$8,669	$ 8,795	$33,294	$27,581	$324,491

Exchange rate: 1979 $1 = 219.17 Yen; 1980 $1 = 226.75 Yen; 1981 $1 = 220.53 Yen; 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen; 1984 $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
From Selected Countries, 1982 to Date
(Values in Thousands of U.S. Dollars)

	1982		1983		1984	
Country of Origin	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	12,972	$175,005	10,879	$136,902	18,811	$123,185
United States	1,245	$ 44,513	1,068	$ 38,275	1,200	$ 18,630
Western Europe						
Austria	740	891	228	206	125	105
France	500	875	424	530	656	951
Italy	68	1,859	53	2,021	96	2,349
Sweden	106	1,602	107	669	102	564
Switzerland	615	35,993	746	28,549	893	40,359
United Kingdom	250	1,863	155	1,373	234	1,890
West Germany	1,200	47,589	734	39,352	861	25,122
Eastern Europe						
Czechoslovakia	11	887	8	674	46	1,718
East Germany	41	7,011	20	1,831	31	2,324
Poland	—	—	—	—	—	—
U.S.S.R.	277	3,806	172	3,238	124	3,532
Asia						
Singapore	694	6,661	850	6,101	948	9,229
Taiwan	5,914	6,107	5,833	3,608	12,367	6,012
Other Countries	1,311	15,348	681	10,475	1,128	10,399

Exchange rate: 1982 $1 = 249.05 Yen; 1983 $1 = 237.52 Yen; 1984 $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

JAPANESE IMPORTS OF METAL CUTTING MACHINE TOOLS
By Type of Machine and Selected Countries, 1984
(Values in Thousands of U.S. Dollars)

Type of Machine	Country of Origin									
	U.S.A.	West Germany	Switzerland	Singapore	Korea	Taiwan	Belgium	Italy	Eastern Europe(a)	U.S.S.R.
GRAND TOTAL										
UNITS	1,200	861	893	948	712	12,367	11	96	88	124
VALUE	$18,630	$25,122	$40,359	$9,229	$6,858	$6,012	$1,415	$2,349	$4,353	$3,535
Boring Machines										
Units	8	3	22	—	—	—	—	6	14	—
Value	$ 905	$ 248	$ 3,145	—	—	—	—	$ 55	$1,065	—
Drilling Machines										
Units	268	9	19	—	42	7,857	—	2	1	27
Value	$ 341	$ 8	$ 206	—	$2,210	$ 463	—	$ 206	$ 25	$ 253
Gear Cutting and Finishing										
Units	55	40	54	—	—	—	10	2	12	9
Value	$ 3,520	$ 3,995	$ 4,109	—	—	—	$1,356	$ 177	$1,499	$ 589
Grinding Machines										
Units	494	330	230	940	5	2,201	1	25	15	18
Value	$11,026	$15,456	$12,934	$9,031	$ 67	$ 400	$ 55	$1,242	$ 724	$ 556
Lathes										
Units	14	66	135	8	421	874	—	3	27	24
Value	$ 198	$ 1,128	$ 7,018	$ 198	$2,476	$3,718	—	$ 25	$ 758	$ 876
Milling Machines										
Units	31	53	18	—	244	915	—	4	19	42
Value	$ 989	$ 1,537	$ 644	—	$1,831	$1,259	—	$ 8	$ 282	$ 918
Planing Machines										
Units	—	—	—	—	—	—	—	—	—	4
Value	—	—	—	—	—	—	—	—	—	$ 345
Other Metal Cutting Machines										
Units	330	360	415	—	—	520	—	54	—	—
Value	$ 1,650	$ 2,753	$12,298	—	—	$ 173	—	$ 636	—	—

(a) Includes Czechoslovakia, East Germany, Hungary and Romania

Note: Individual items may not add to totals due to rounding.

Exchange rate: $1 = 237.52 Yen.

Source: Japan, Ministry of Finance.

UNITED KINGDOM NET NEW ORDERS AND SHIPMENTS OF MACHINE TOOLS
1962 to Date
(Millions of Dollars)

	Net New Orders			Shipments			Unfilled Orders
Year	Total	Domestic	Foreign	Total	Domestic	Foreign	
1962	$ 276.0	$169.4	$106.7	$ 356.3	$256.9	$ 99.4	$247.3
1963	265.4	171.3	94.1	319.2	209.7	109.6	193.0
1964	388.4	282.0	106.5	339.5	234.1	105.4	241.5
1965	442.0	322.0	120.0	395.9	272.9	123.0	292.0
1966	448.3	319.5	128.8	459.2	332.9	126.3	310.0
1967	446.6	276.7	169.9	473.7	342.8	130.9	279.2
1968	441.1	290.6	150.5	404.6	272.4	132.2	278.6
1969	569.3	361.7	207.6	453.8	285.8	168.0	394.1
1970	513.4	313.9	199.4	524.6	329.5	195.1	382.8
1971	380.9	199.8	181.1	513.1	300.6	212.4	261.8
1972	480.4	303.5	176.9	462.1	279.2	182.9	283.5
1973	701.2	429.1	272.1	487.2	286.8	200.4	473.0
1974	813.7	448.8	364.9	595.0	350.6	244.4	731.9
1975	548.4	321.5	226.9	723.0	414.2	308.8	510.6
1976	570.8	346.8	224.0	635.8	377.5	258.3	350.4
1977	839.8	553.5	286.3	707.1	443.5	263.6	471.4
1978	1,046.4	689.3	357.1	960.0	599.0	361.0	604.8
1979	1,260.3	771.6	488.7	1,205.9	793.6	412.3	742.7
1980	1,038.8	562.3	476.5	1,370.6	813.9	556.7	418.7
1981	865.3	273.2	592.1	885.3	480.6	404.7	304.2
1982(r)	576.8	327.0	249.8	779.0	429.4	349.6	157.5
1983(r)	471.7	259.7	212.0	556.8	331.3	225.5	NA
1984(p)	536.0	278.1	248.9	525.3	310.3	215.0	NA

NA - Not Available. p - Preliminary. r - Revised.

Source: The Machine Tool Trades Association and Department of Trade and Industry.

UNITED KINGDOM EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
Number of Employees, 1967 to Date

Mid-Year	Employees	Mid-Year	Employees
1967	65,500	1977	47,675
1968	63,600	1978	48,500
1969	63,700	1979	48,350
1970	65,100	1980	46,350
1971	59,000	1981(r)	40,500
1972	50,100	1982(r)	37,000
1973	48,400	1983(r)	30,600
1974	50,000	1984(p)	29,900
1975	49,100		
1976	47,050		

p - Preliminary. r - Revised.

Source: The Machine Tool Trades Association and the Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS
By Type of Machine, Units and Value, 1983 and 1984
(Values in Thousands of U.S. Dollars)

Type of Machine	1983 Units	1983 Value	1984 Units	1984 Value
TOTAL (excluding parts)	1,825	$130,767	NA	$157,949
Drilling Machines Boring Machines Milling Machines	35	3,752	NA	36,766
Machining Centers - Horizontal	56	17,838	111	19,311
Machining Centers - Vertical	92	8,893	227	23,181
Machining Centers (manual tool change) and Indexing Turret	737	29,090	(a)	(a)
Lathes	667	36,444	816	40,419
Other Numerically Controlled Machines	238	34,750	387	38,272

Exchange Rate: 1983: 1 Pound = $1.517. 1984: 1 Pound = $1.3363.

(a) "Machining Centers (manual tool change) and Indexing Turret" are included with Drilling, Boring, and Milling Machines.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM ORDERS AND SHIPMENTS OF NUMERICALLY CONTROLLED MACHINE TOOLS
1968 to Date
(Values in Thousands of Dollars)

	New Orders				Shipments			
	Total		Foreign		Total		Foreign	
Year	Units	Value	Units	Value	Units	Value	Units	Value
1968(a)	505	$ 34,157	130	$10,904	558	28,500	109	$ 6,113
1969(a)	693	42,245	248	16,596	543	35,105	189	14,738
1970(a)	725	52,561	350	26,978	600	37,773	241	15,848
1971	343	26,320	156	12,842	590	44,591	280	23,023
1972	548	42,199	189	14,551	381	27,173	150	12,735
1973	634	44,562	238	18,884	462	30,379	178	13,255
1974	739	65,520	353	32,362	709	37,452	246	15,171
1975	283	28,833	70	8,610	739	52,719	271	20,898
1976	535	57,429	157	17,820	612	48,635	192	17,598
1977	614	78,484	155	22,406	724	58,307	NA	17,347(b)
1978	681	105,986	209	26,135	969	102,376	245	29,086
1979	1,262	180,516	399	48,063	1,058	139,125	251	36,078
1980	978	160,736	397	60,193	1,240	198,985	421	54,712
1981	1,237	192,812	398	75,702	1,196	165,037	399	56,167
1982(r)	1,370	124,583	NA	35,280	1,510	173,718	424	74,738
1983(r)	2,010	125,721	NA	42,646	1,825	130,767	489	43,804
1984(p)	NA	153,457	NA	60,383	NA	157,949	815	50,584

NA - Not Available. p - Preliminary. r - Revised.

(a) Includes parts.
(b) Does not include figures for Drilling, Boring or Milling Machines.

Source: The Machine Tool Trade Association, and United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL CUTTING MACHINE TOOLS (a)

By Type of Machine, Units and Value, 1983 and 1984

(Values in Thousands of U.S. Dollars)

Type of Machine	1983 (r) Units	1983 (r) Value	1984 Units	1984 Value
TOTAL	—	$292,900	—	$249,534
Boring Machines				
Fine	124E	3,415	56	1,743
Horizontal	6	724	19E	1,898
Jig, Vertical and Other	1	26	—	—
Drilling Machines				
Vertical	1,141	2,051	901E	1,418
Radial and Other	72	1,669	60	1,155
Gear Cutting and Finishing Machines	(c)	(c)	(c)	(c)
Grinding and Polishing Machines				
Cylindrical—External	NA	8,912	129	7,561
Cylindrical—Universal	112	5,168	716	18,569
Cylindrical—Internal	10	840		
Surface	499	7,623		
Other Grinding	NA	5,331	619	4,649
Honing and Lapping	417(b)	7,694(b)	377	5,646(b)
Lathes				
Automatic (excl. plugboard)	NA	11,027	NA	33,794
Center	6,099	36,379	294	6,342
Plugboard Other	NA	12,101		
Milling Machines				
Knee and Column	1,159	16,200	1,435	15,293
Bed Type	23	2,357	24	1,895
Other	158	2,295	132	1,527
Other Metal Cutting				
Transfer, Single Station and Unit Head Machines	682E	42,024	398E	26,511
Sawing and Cut-Off Screwing and Threading	NA	33,436	8,948E	15,770E
Other Metal Cutting, N.E.C.			NA	11,847
Parts for Metal Cutting Machine Tools	—	93,631	—	93,911

NA - Not Available. r - Revised. E - Estimate.

(a) Excludes numerically controlled machines.

(b) Includes cam shaft, cam, spline, jig, profile, swing frame, billet, cone centre and rack track.

(c) Included in "Other metal Cutting, N.E.C."

Note: Individual items may not add to totals due to rounding.

Exchange Rate: 1983: 1 Pound = $1.517; 1984: 1 Pound = $1.3363.

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM SHIPMENTS OF METAL FORMING MACHINE TOOLS (a)
By Type of Machine, Units and Value, 1983 and 1984
(Values in Thousands of U.S. Dollars)

Type of machine	1983		1984	
	Units	Value	Units	Value
TOTAL	—	$102,048	—	$90,906
Presses				
Hydraulic—Open Front	264	6,082	288	9,989
Hydraulic— Straight, Extrusion & Other	(b)	(b)	(b)	(b)
Mechanical—Open Front	151	3,016	116E	1,963
Mechanical—Straight Sided	(b)	(b)	(b)	(b)
Other Mechanical	52	6,256	36	3,608
Forging Machines	1,660	2,417	1,730	1,566
Shearing Machines	NA	11,364	NA	6,572
Plate & Sheet Bending & Forming	(b)	(b)	(b)	(b)
Bar, Tube & Section Drawing & Forming	917	14,072	294	13,370
Wire and Strip Drawing & Forming	158E	2,694	192	3,075
Other Bending & Working incl. Sheet Metal	(b)	(b)	(b)	(b)
Riveting and Other Metal Forming	1,371	24,762	1,439	23,202
Parts for Metal Forming Machine Tools	—	31,385	—	27,561

E - Estimate.

Exchange Rate: 1983: 1 Pound = $1.517; 1984: 1 Pound = $1.3363.

(a) Excludes numerically controlled machines.
(b) Included in "Riveting and Other Metal Forming."

Source: United Kingdom, Department of Trade and Industry.

UNITED KINGDOM IMPORTS AND EXPORTS OF MACHINE TOOLS
New and Used, for Selected Countries, 1984
(Values in U.S. Dollars)

Imports		Exports			
Origin	Value	Destination	Value	Destination	Value
West Germany	$103,339,210	United States	$79,963,310	Australia	$4,627,030
Japan	67,642,790	West Germany	27,641,275	Spain	4,544,366
U.S.A.	46,050,213	France	15,275,896	Pakistan	3,688,390
Italy	27,929,317	U.S.S.R.	14,324,600	Singapore	3,330,407
Switzerland	25,153,521	South Africa	13,048,638	Israel	2,815,166
France	11,706,464	India	10,924,597	Japan	2,777,159
Sweden	9,564,058	Canada	9,772,179	Denmark	2,707,186
Belgium-Lux.	8,575,076	Sweden	8,394,248	Saudia Arabia	2,215,520
Taiwan	7,065,875	Italy	8,298,964	Austria	2,200,704
Netherlands	6,336,252	Switzerland	6,996,066	Turkey	2,117,823
United Kingdom	6,123,994	Belgium-Lux.	6,267,435	Taiwan	1,591,108
Spain	6,160,189	Egypt	5,692,786	China	1,483,754
Denmark	2,591,917	Irish Republic	5,546,065	Poland	1,387,287
Irish Republic	2,452,924	Iraq	5,402,183	Mexico	686,264
Austria	1,988,756	Netherlands	5,144,922	East Germany	277,898

Exchange Rate: 1 Pound = $1.3363.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1983
By Type of Machine, Total and N/C; Total & Major Countries of Destination
(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	Rep. of So. Africa	France	U.S.S.R.	India	Mexico
Grand Total (incl. N/C)								
Units	24,736	3,129	1,554	990	2,153	148	353	96
Value	$289,157	$49,090	$25,105	$20,989	$21,735	$14,508	$12,529	$11,725
Boring (incl. N/C)								
Units	328	64	43	30	14	—	14	—
Value	$ 14,948	$ 3,659	$ 1,494	$ 3,184	$ 115	—	$ 3,070	—
Boring, N/C								
Units	24	6	7	2	—	—	2	—
Value	$ 7,086	$ 1,188	$ 1,094	$ 700	—	—	$ 2,338	—
Drilling (incl, N/C)								
Units	1,114	20	33	33	69	1	8	—
Value	$ 6,022	$ 266	$ 422	$ 496	$ 633	$ 124	$ 250	—
Drilling, N/C								
Units	16	2	1	—	3	1	2	—
Value	$ 1,509	$ 153	$ 46	—	$ 526	$ 124	$ 222	—
Gear Cutting & Finishing (incl. N/C)								
Units	26	6	1	1	4	—	2	—
Value	$ 3,120	$ 597	$ 58	$ 80	$ 346	—	$ 163	—
Gear Cutting & Finishing, NC								
Units	1	—	—	—	—	—	—	—
Value	$ 288	—	—	—	—	—	—	—
Grinding & Polishing (incl. N/C)								
Units	8,602	589	403	185	1,139	69	78	8
Value	$ 50,761	$13,125	$ 3,124	$ 3,311	$ 3,112	$ 5,285	$ 3,015	$ 1,353
Grinding & Polishing, NC								
Units	35	20	1	1	1	—	—	—
Value	$ 8,831	$ 6,184	$ 93	$ 200	$ 294	—	—	—
Lathes (incl. N/C)								
Units	3,453	760	323	45	192	28	16	72
Value	$ 57,897	$11,288	$ 2,761	$ 782	$ 5,335	$ 1,719	$ 1,162	$ 6,442
Lathes, N/C								
Units	229	65	9	3	16	2	5	69
Value	$ 22,889	$ 4,743	$ 828	$ 271	$ 1,805	$ 278	$ 440	$ 6,169
Milling (incl. N/C)								
Units	917	136	36	57	79	1	13	1
Value	$ 22,784	$ 5,768	$ 1,313	$ 1,818	$ 1,719	$ 6	$ 1,235	$ 62
Milling, N/C								
Unit	58	9	12	6	6	—	—	—
Value	$ 3,334	$ 168	$ 880	$ 211	$ 347	—	—	—
Other Metal Cutting								
Units	2,570	770	242	75	91	6	40	—
Value	$ 32,855	$ 6,299	$ 4,829	$ 1,673	$ 5,371	$ 71	$ 889	—
Total Metal Forming								
Units	7,726	784	473	564	565	43	182	15
Value	$100,771	$ 8,088	$11,104	$ 9,649	$ 5,103	$ 7,303	$ 2,746	$ 3,869

Exchange Rate: 1 Pound = $1.517.

Source: The Department of Trade and Industry.

UNITED KINGDOM EXPORTS OF NEW MACHINE TOOLS, 1984

By Type of Machine, Total and N/C; Total & Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	United States	West Germany	Rep. of So. Africa	France	U.S.S.R.	India	Canada
Grand Total (incl. N/C)								
Units	18,226	3,484	1,152	766	923	122	247	748
Value	$278,629	$ 70,036	$26,789	$11,107	$15,022	$14,326	$9,993	$7,510
Boring (incl. N/C)								
Units	294	65	38	12	7	—	15	9
Value	$ 12,389	$ 2,516	$ 3,231	$ 1,353	$ 96	—	$1,308	$ 267
Boring, N/C								
Units	44	4	21	6	—	—	4	—
Value	$ 7,450	$ 1,033	$ 2,966	$ 1,067	—	—	$1,079	—
Drilling (incl. N/C)								
Units	1,206	66	55	73	12	2	14	5
Value	$ 6,691	$ 459	$ 673	$ 253	$ 195	$ 138	$ 278	$ 64
Drilling, N/C								
Units	20	—	4	—	—	1	2	—
Value	$ 1,644	—	$ 270	—	—	$ 136	$ 84	—
Gear Cutting & Finishing (incl. N/C)								
Units	40	13	2	1	1	11	1	—
Value	$ 4,383	$ 1,175	$ 248	$ 34	$ 39	$ 1,327	$ 19	—
Gear Cutting & Finishing, NC								
Units	1	1	—	—	—	—	—	—
Value	$ 134	$ 134	—	—	—	—	—	—
Grinding & Polishing(incl. N/C)								
Units	3,069	640	221	127	126	24	73	200
Value	$ 49,954	$19,410	$ 5,546	$ 1,444	$ 1,656	$ 1,77[illegible]	$2,202	$1,214
Grinding & Polishing, N/C								
Units	50	25	11	—	1	—	1	1
Value	$ 13,394	$ 7,724	$ 2,198	—	$ 165	—	$ 58	$ 451
Lathes (incl. N/C)								
Units	3,480	953	230	40	193	53	25	168
Value	$ 51,707	$15,450	$ 4,179	$ 623	$ 3,022	$ 2,994	$ 936	$1,215
Lathes, N/C								
Units	226	93	15	1	24	2	5	28
Value	$ 13,676	$ 4,693	$ 1,934	$ 97	$ 1,387	$ 154	$ 648	$ 297
Milling (incl. N/C)								
Units	1,076	170	65	23	37	2	4	28
Value	$ 26,143	$ 7,138	$ 1,928	$ 608	$ 1,109	$ 1,325	$ 55	$ 629
Milling, N/C								
Units	161	45	22	9	11	—	—	6
Value	$ 7,981	$ 2,345	$ 1,331	$ 258	$ 645	—	—	$ 423
Other Metal Cutting								
Units	2,861	1,008	135	124	133	16	34	180
Value	$ 38,334	$ 7,798	$ 4,291	$ 1,148	$ 4,915	$ 165	$3,105	$1,378
Total Metal Forming								
Units	6,200	669	406	366	414	14	81	158
Value	$ 89,028	$16,090	$ 6,693	$ 5,644	$ 3,990	$ 6,604	$2,090	$2,743

Exchange Rate: 1 Pound = $1.3363.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1983
By Type of Machine, Total and N/C; Total & Major Countries of Destination
(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	Japan	United States	Switzerland	Italy	France	Sweden
Grand Total (incl. N/C)								
Units	55,520	5,276	3,318	3,880	746	3,377	1,919	729
Value	$286,599	$86,560	$53,385	$40,675	$20,597	$19,860	$12,038	$10,677
Boring (incl. N/C)								
Units	353	84	8	15	8	65	48	3
Value	$ 12,414	$ 7,250	$ 540	$ 246	$ 574	$ 1,486	$ 373	$ 125
Boring, N/C								
Units	50	26	6	1	2	3	—	—
Value	$ 8,217	$ 5,862	$ 538	$ 2	$ 453	$ 400	—	—
Drilling (incl. N/C)								
Units	8,363	332	329	504	45	33	187	128
Value	$ 8,582	$ 1,771	$ 268	$ 3,148	$ 494	$ 246	$ 388	$ 466
Drilling, N/C								
Units	104	10	4	35	1	—	2	1
Value	$ 4,131	$ 676	$ 155	$ 2,741	$ 116	—	$ 76	$ 326
Gear Cutting & Finishing (incl. N/C)								
Units	330	7	2	4	1	3	—	—
Value	$ 2,226	$ 964	$ 80	$ 695	$ 27	$ 206	—	—
Gear Cutting & Finishing, NC								
Units	2	—	—	2	—	—	—	—
Value	$ 636	—	—	$ 636	—	—	—	—
Grinding & Polishing (incl. N/C)								
Units	24,928	1,360	1,673	714	162	628	224	316
Value	$ 38,450	$10,849	$ 2,410	$ 5,946	$ 6,036	$ 2,439	$ 493	$ 1,950
Grinding & Polishing, NC								
Units	659	22	—	15	7	1	—	6
Value	$ 10,740	$ 4,344	—	$ 1,918	$ 2,864	$ 91	—	$ 900
Lathes (incl. N/C)								
Units	2,135	202	382	227	85	70	30	27
Value	$ 60,613	$16,900	$20,283	$ 6,078	$ 1,795	$ 3,965	$ 735	$ 2,409
Lathes, N/C								
Units	669	128	319	64	11	25	4	23
Value	$ 49,863	$14,914	$19,780	$ 5,152	$ 641	$ 2,832	$ 209	$ 2,402
Milling (incl. N/C)								
Units	1,022	238	40	20	29	60	81	11
Value	$ 17,916	$ 5,302	$ 1,869	$ 667	$ 1,127	$ 1,806	$ 2,577	$ 48
Milling, N/C								
Unit	69	24	6	6	3	4	15	—
Value	$ 7,300	$ 2,461	$ 1,111	$ 580	$ 718	$ 440	$ 1,600	—
Other Metal Cutting								
Units	8,247	1,001	467	702	97	1,435	844	24
Value	$ 69,966	$20,266	$21,887	$12,936	$ 3,294	$ 4,691	$ 1,759	$ 262
Total Metal Forming								
Units	10,142	2,052	408	1,694	319	1,083	505	220
Value	$ 76,432	$23,258	$ 6,048	$10,959	$ 7,250	$ 5,021	$ 5,713	$ 5,417

Exchange Rate: 1 Pound = $1.517.

Source: The Department of Trade and Industry.

UNITED KINGDOM IMPORTS OF NEW MACHINE TOOLS, 1984
By Type of Machine, Total and N/C; Total & Major Countries of Destination
(Values in Thousands of U.S. Dollars)

Type of Machine	Total Worldwide	West Germany	United States	Japan	Switzerland	Italy
Grand Total (incl. N/C)						
Units	54,117	8,075	2,583	2,339	828	11,892
Value	$339,534	$102,668	$45,529	$67,581	$24,995	$27,581
Boring (incl. N/C)						
Units	406	75	24	13	10	20
Value	$ 17,160	$ 8,467	$ 1,243	$ 818	$ 92	$ 398
Boring, N/C						
Units	75	39	2	8	1	1
Value	$ 13,343	$ 7,082	$ 473	$ 803	$ 48	$ 124
Drilling (incl. N/C)						
Units	6,127	215	189	37	38	66
Value	$ 13,301	$ 2,656	$ 5,373	$ 528	$ 273	$ 1,186
Drilling, N/C						
Units	8	3	2	—	—	—
Value	$ 315	$ 262	$ 19	—	—	—
Gear Cutting & Finishing (incl. N/C)						
Units	47	28	7	—	1	2
Value	$ 4,318	$ 2,810	$ 762	—	$ 200	$ 80
Gear Cutting & Finishing, N/C						
Units	17	12	3	—	1	—
Value	$ 2,011	$ 1,306	$ 426	—	$ 200	—
Grinding & Polishing (incl. N/C)						
Units	24,920	3,980	571	364	154	7,413
Value	$ 41,602	$ 15,271	$ 5,941	$ 3,165	$ 5,709	$ 3,891
Grinding & Polishing, N/C						
Units	80	43	10	5	9	9
Value	$ 12,490	$ 6,806	$ 2,295	$ 321	$ 1,396	$ 1,070
Lathes (incl. N/C)						
Units	2,362	456	221	465	72	74
Value	$ 80,652	$ 25,508	$11,081	$26,622	$ 2,115	$ 2,432
Lathes, N/C						
Units	859	188	68	429	7	30
Value	$ 63,620	$ 21,274	$ 5,945	$25,709	$ 630	$ 1,523
Milling (incl. N/C)						
Units	1,277	274	19	39	16	107
Value	$ 22,116	$ 7,304	$ 534	$ 2,252	$ 1,024	$ 3,875
Milling, N/C						
Units	174	69	7	26	5	30
Value	$ 12,947	$ 5,187	$ 321	$ 2,028	$ 719	$ 3,101
Other Metal Cutting						
Units	9,457	1,149	288	1,153	143	2,388
Value	$ 72,583	$ 15,356	$ 7,747	$25,868	$ 5,646	$ 8,712
Total Metal Forming						
Units	9,521	1,898	1,264	268	394	1,822
Value	$ 87,799	$ 25,293	$12,848	$ 8,324	$ 9,938	$ 7,007

Exchange Rate: 1 Pound = $1.3363.

Source: The Department of Trade and Industry.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS

By Type of Machine, Units and Value, 1982, 1983 and 1984

(Thousands of U.S. Dollars)

	1982		1983		1984	
Type of Machine	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	12,735	$176,697	17,815	$86,244	13,057	$56,133
Metal Cutting Total	9,237	91,336	11,774	62,989	10,163	36,631
Lathes	353	25,995	346	9,699	309	6,593
Boring Machines	66	1,189	80	701	404	992
Milling Machines	475	3,127	628	5,511	620	2,710
Planing Machines	106	21	99	48	2	2
Broaching Machines	6	1,350	11	482	11	152
Drilling Machines	559	3,321	537	1,071	776	970
Grinding & Polishing Machines	6,039	19,316	8,695	13,365	7,077	13,641
Gear Cutting Machines	22	3,543	52	7,969	17	2,848
Other Metal Cutting	1,611	33,473	1,326	24,143	947	8,723
Metal Forming Total	3,498	85,361	6,041	23,255	2,894	19,502
Presses	894	52,054	584	6,742	157	3,231
Forging & Stamping Machines	25	6,214	252	1,255	14	379
Bending & Rolling Machines	360	7,288	392	2,891	356	2,799
Other Metal Forming	2,219	19,805	4,813	12,367	2,367	12,643
TOTAL EXPORTS	58,800	$175,525	83,393	$99,427	75,481	$113,261
Metal Cutting Total	15,325	124,654	21,591	68,981	32,883	85,164
Lathes	2,045	28,087	1,275	13,238	2,351	16,103
Boring Machines	142	11,008	75	5,446	123	5,108
Milling Machines	5,274	45,679	3,374	30,131	19,051	39,688
Planing Machines	25	679	14	684	41	163
Broaching Machines	104	130	—	—	6	33
Drilling Machines	2,174	9,038	1,151	4,626	2,241	5,432
Grinding & Polishing Machines	2,571	14,180	9,644	6,094	6,589	8,449
Gear Cutting Machines	22	541	6	80	8	150
Other Metal Cutting	2,968	15,314	6,052	8,682	2,473	10,038
Metal Forming Total	43,475	50,872	61,802	30,446	42,598	28,097
Presses	1,530	14,841	1,138	8,604	1,317	9,887
Forging & Stamping Machines	92	2,694	29	588	30	537
Bending & Rolling Machines	1,828	6,726	1,545	3,943	257	4,312
Other Metal Forming	40,025	26,610	59,090	17,311	40,994	13,361

Exchange Rate: 1982 $1 = 109.52 Pesetas; 1983 $1 = 143.43 Pesetas; 1984 $1 = 160.76 Pesetas.

Source: Asociación Española de Fabricantes de Máquinas-Herramienta.

SPANISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Origin and Destination, 1982 to Date (a)
(Thousands of U.S. Dollars)

	Imports			Exports		
Country	1982	1983	1984	1982	1983	1984
GRAND TOTAL	$176,697	$86,244	$56,133	$175,525	$99,427	$113,261
Argentina	—	—	—	754	79	1,291
Australia	—	—	—	2,093	993	3,009
Austria	364	—	221	1,038	—	996
Belgium-Luxemburg	1,236	707	537	1,968	2,061	1,814
Canada	86	—	60	2,710	1,269	3,113
Chile	—	—	—	1,002	—	230
Cuba	—	—	—	8,811	1,288	1,855
East Germany	—	—	847	—	—	—
Ecuador	—	—	—	1,306	1,039	564
Finland	—	—	—	4,485	1,493	1,463
France	11,426	23,786	4,556	12,754	7,974	8,197
Italy	21,514	10,388	8,796	5,027	2,617	2,397
Japan	22,666	6,142	3,207	25	—	7
Mexico	231	—	—	32,907	6,677	4,126
Morocco	—	—	—	2,161	1,573	713
Netherlands	892	606	1,119	2,307	1,925	2,521
Portugal	—	—	—	5,624	1,958	3,238
South Africa	—	—	—	6,979	3,334	3,096
Sweden	1,288	1,034	2,186	2,105	2,151	3,118
Switzerland	5,739	3,188	6,036	1,469	1,335	1,566
United Kingdom	5,068	1,830	3,712	6,884	5,243	6,626
U.S.A.	19,176	2,171	4,007	21,910	8,644	15,981
Venezuela	—	—	—	7,328	3,664	3,919
West Germany	85,627	29,623	19,023	14,229	12,277	15,706
All Other	1,384	6,767	1,826	28,839	31,832	27,715

Exchange Rate: 1982 $1 = 109.52 Pesetas; 1983 $1 = 143.43 Pesetas; 1984 $1 = 160.76 Pesetas.

(a) Countries without data are included in "All Other."

Source: Asociación Española de Fabricantes de Máquinas Herramienta.

SPANISH MACHINE TOOL EMPLOYMENT AND CONSUMPTION
Employment in thousands, values in thousands of dollars

Year	Shipments	Imports	Exports	Consumption	Employment
1973	$146,112	$ 89,359	$ 40,334	$195,137	12.1
1974	206,873	135,009	69,789	272,093	12.2
1975	223,117	168,693	86,532	305,277	11.6
1976	183,600	132,679	90,811	225,468	11.0
1977	190,872	91,373	102,529	179,716	10.5
1978	232,185	90,072	147,579	176,823	10.3
1979	315,829	91,322	210,766	196,385	10.0
1980	352,849	103,196	226,268	227,777	9.5
1981	319,957	142,038	207,038	254,957	8.8
1982	260,226	176,697	175,525	261,398	8.5
1983	188,245	86,244	99,427	175,063	7.6
1984	211,495	56,133	113,261	154,364	7.4

Source: Asociacion Espanola de Fabricantes de Maquinas-Herramientar.

FRENCH PRODUCTION OF METAL CUTTING MACHINE TOOLS
By Type of Machine, Units and Value, 1982, 1983 and 1984
(Values in Thousands of U.S. Dollars)

Type of Machine	1982		1983		1984	
	Units	Value	Units	Value	Units	Value
Engine & Turret Lathes, NC	474	$48,862	170	$ 16,929	323	$23,486
Vertical Boring & Turning Mills, NC	38	17,182	42	15,774	(g)	(g)
Turning Centers, NC	105	10,447	113	11,555	110	10,494
Other Lathes, NC	(c)	(c)	168	16,648	183(g)	30,395(g)
Engine Lathes, non-NC	1,407	25,539	878	15,208	338	5,354
Copying, Multi-Tool & Semi-Automatic Turret Lathes, non-NC	101	9,170	(c)	(c)	28	1,127
Single-Spindle Automatic Lathes, non-NC	93	4,712	21	410	55(d)	1,224(d)
Other Lathes, non-NC	76	4,242	60	966	40	821
Comb. Boring & Milling Machines, NC	12	6,730	11	4,578	7	2,759
Comb. Boring & Milling Machines, non-NC	(c)	(c)	67	910	(c)	(c)
Boring Machines, NC	(c)	(c)	(c)	(c)	—	—
Boring Machines, non-NC	28	837	14	1,429	18	762
Milling Machines, NC	251	56,551	238	34,308	334	48,221
Knee-Type Milling Machines, non-NC	1,359	35,630	897	21,010	533	12,146
Bed-Type Milling Machines, non-NC	246	12,825	113	5,235	150	4,675
Other Milling Machines, non-NC	70	2,801	711	5,236	648	3,445
Drilling Machines, NC	(c)	(c)	(c)	(c)	(c)	(c)
Comb. Drilling & Boring Machines, NC	(c)	(c)	(c)	(c)	(c)	(c)
Radial Drilling Machines, non-NC	132	1,370	(c)	(c)	55	463
Bench Type Drilling Machines, non-NC	2,883	2,331	2,043	1,595	1,828	1,329
Pillar Type Driling Machines, non-NC	1,702	3,148	1,219	2,199	1,072	1,073
Column Type Drilling Machines, non-NC	57	2,416	44	1,528	37	1,028
Grinding Machines, NC	(c)	(c)	(c)	(c)	(c)	(c)
Universal Tool & Cutter Grinding Machines, non-NC	(c)	(c)	237	2,306	6,102	3,955
Single Point Cutting Tool Sharpening Machines, non-NC	(c)	(c)	(c)	(c)		
Cutter Sharpening Machines, non-NC	1,003	1,115	793	405		
Other Tool & Cutter Grinding Machines, non-NC	285	4,063	(c)	(c)		
Universal Cylindrical Grinding Machines, non-NC	45	2,062	21	971	14	304
Internal Cylindrical Grinding Machines, non-NC			63	4,769	183	6,344
External Cylindrical Grinding Machines, non-NC	69	6,531				
Surface Grinding Machines, non-NC	250	3,568	102	1,757		
Other Grinding Machines, non-NC	80	5,714	97	5,636		
Screw Cutting Machines, non-NC	(c)	(c)	476	2,185	(c)	(c)
Tapping Machines, non-NC	(c)	(c)	247	358	185	246
Planing Machines, non-NC	—	—	—	—	—	—
Slotting & Shaping Machines, non-NC	61	412	(c)	(c)	(c)	(c)
Surfacing Machines, non-NC	5,852	1,198	7,241	1,652	8,884	1,701
Polishing, Honing & Lapping Machines, non-NC	895	4,085	159	1,054	554	2,287
Broaching Machines, non-NC	—	—	—	—	(c)	(c)
Gear Cutting Machines, non-NC	(c)	(c)	(c)	(c)	(c)	(c)
Sawing & Cut-Off Machines, non-NC	1,248	4,333	857	3,663	829	1,996
Band Sawing Machines, non-NC	322	2,849	223	1,752	183	1,276
Other Sawing or Cut-Off Machines, non-NC	1,960	4,048	(c)	(c)	(c)	(c)
Spark Erosion Machines, non-NC	(c)	(c)	50	2,598	35	388
Transfer Lines	201	71,223	216	123,201	208	71,915
Unit Heads	228	776	332	722	438	1,325
Machining Centers	123	28,503	121	24,201	167	25,763
Other Metal Cutting Machines, NC	45	18,761	12	1,972	14	1,976
Other Metal Cutting Machines, non-NC	11,098	54,064	(c)	(c)	13,485	23,834
Total Metal Cutting, NC	1,100	187,626	1,059(e)	246,966 (e)	1,283(f)	208,207(f)
TOTAL METAL CUTTING	NA	NA	30,723(e)	384,045 (e)	38,682(f)	299,[illegible]93(f)

NA - Not Available.

Exchange Rate: 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs; 1984 $1 = 8.7391 Francs.

(c) Data withheld.

(d) Includes "Multi-Spindie Automatic Lathes, Non-NC."

(e) Does not include Surface Grinding Machines.

(f) Does not include "Spark Erosion Machines, NC."

(g) "Vertical Boring & Turning Mills, NC" are included in "Other Lathes, NC."

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION OF METAL FORMING MACHINE TOOLS

By Type of Machine, Units and Value, 1982, 1983 and 1984

(Values in Thousands of U.S. Dollars)

Type of Machine	1982		1983		1984	
	Units	Value	Units	Value	Units	Value
Sheet Metal Bending Machines, non-NC	224	$ 2,003	212	$ 1,559	38	$ 643
Sheet Metal Folding Machines, non-NC	1,137	2,145	966	1,652	470	954
Sheet Metal Straightening Machines, non-NC	43	3,342	316	1,299	(b)	(b)
Bar & Tube Drawing Machines, non-NC	(b)	(b)	(b)	(b)	—	—
Straightening Machines, non-NC	(b)	(b)	(b)	(b)	(b)	(b)
Profiling, Flanging & Molding Machines, non-NC	86	2,080	41	1,298	22	1,208
Other Bending Machines, non-NC	602	2,008	(b)	(b)	(b)	(b)
Punching, Shearing & Comb. Punching & Shearing Machines, NC	(b)	(b)	(b)	(b)	(b)	(b)
Mechanical Shearing Machines, non-NC	249	1,180	96	781	(b)	(b)
Hydraulic Shearing Machines, non-NC	677	12,225	546	9,231	447	6,588
Other Shearing Machines, non-NC	1,754	2,796	1,025	778	622	233
Punching Machines, non-NC	262	807	111	806	79	744
Comb. Punching & Shearing Machines, non-NC	(b)	(b)	64	752	(b)	(b)
Wireworking Machines, non-NC	(b)	(b)	58	3,924	83	2,295
Presses, NC	(b)	(b)	—	—	—	—
Open Front Mechanical Presses, non-NC:						
Less than 10 tonnes	44	227	(b)	(b)	349	1,791
10-16 tonnes						
16-25 tonnes	30	246				
25-40 tonnes	26	438				
40-63 tonnes	11	236				
63-80 tonnes	7	196				
80-100 tonnes	5	155				
100-125 tonnes	—	—				
125+ tonnes	10	480				
Single or Double Action, non-NC	(b)	(b)			(b)	(b)
Forging, Stamping & Percussion Presses, non-NC	(b)	(b)	(b)	(b)	(b)	(b)
Presses w/Automatic Feed, non-NC	(b)	(b)	—	—	(b)	(b)
Mechanical Press Brakes, non-NC	(b)	(b)	(b)	(b)	—	—
Hydraulic Press Brakes, non-NC	696	13,716	(b)	(b)	384	4,851
Drop & Air Hammers, non-NC	—	—	—	—	—	—
Open Front Hydraulic Presses, non-NC	80	1,493	115	4,615	128	2,918
Other Hydraulic Presses, non-NC	211	15,590	(b)	(b)	(b)	(b)
Other Metal Forming Machines, NC	31	833	(b)	(b)	(b)	(b)
Other Metal Forming Machines, non-NC	14,481	18,997	(b)	(b)	(b)	(b)
Total Metal Forming, NC	146	4,799	236	8,147	342	17,667
TOTAL METAL FORMING	NA	NA	6,590	80,470	5,064	76,960

NA - Not Available.

Exchange Rate: 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs; 1984 $1 = 8.7391 Francs.

(b) Data withheld.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH PRODUCTION AND EXPORTS OF N/C MACHINES (a)
Units and Value, 1968 to Date
(Values in Millions of U.S. Dollars)

Year	Production		Exports	
	Units	Value	Units	Value
1968	154	$ 12.2	46	NA
1969	154	12.7	64	NA
1970	147	11.0	46	$ 3.9
1971	247	25.0	83	10.5
1972	230	27.8	61	5.6
1973	389	42.7	141	12.6
1974	535	51.0	261	22.3
1975	612	75.5	217	23.7
1976	576	80.4	165	26.6
1977	579	97.6	223	52.7
1978	867	163.3	391	104.0
1979	1,068	196.1	417	94.5
1980	1,238	189.2	370	85.2
1981	1,238	208.4	NA	NA
1982(r)	1,246	192.4	NA	NA
1983	1,295(b)	255.1(b)	NA	NA
1984	1,625(c)	225.9(c)	NA	NA

NA - Not Available. r - Revised.

(a) The survey covered metalworking and woodworking manufacturers.
(b) Does not include Surface Grinding Machines.
(c) Does not include Spark Erosion Machines.

Source: Syndicat des Constructeurs Français de Machines-Outils; Survey of 300 enterprises.

FRENCH MACHINE TOOL INDUSTRY
Selected Data, 1980 to Date
(Values in Millions of U.S. Dollars)

	1980	1981	1982	1983	1984
Employment	19,650	18,984	17,661	15,502	13,443
Production Workers	11,597	11,166	10,265	8,982	7,656
Others	8,053	7,818	7,396	6,520	5,787
Average Weekly Hours	40.7	40.2	38.6	37.8	38.0
Compensation	$ 314.9	$ 271.3	$ 237.2	$ 197.0	$ 156.8
Wages	150.5	131.3	112.2	90.1	72.0
Salaries	164.4	140.0	125.0	106.8	84.8
Orders(a)	$1,015.4	$ 722.4	$ 587.7	$ 489.9	$ 474.0
Domestic	680.3	438.2	410.8	320.1	315.7
Foreign	335.1	284.2	176.9	169.8	158.3
Shipments(a)	$ 954.0	$ 809.5	$ 622.1	$ 560.1	$ 465.5

Exchange Rate: 1980 $1 = 4.226 Francs; 1981 $1 = 5.4346 Francs; 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs; 1984 $1 = 8.7391 Francs.

(a) Excluding Tax.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH EXPORTS OF MACHINE TOOLS

By Destination, Units and Value, 1982 to Date

(Values in Thousands of U.S. Dollars)

Destination	1982		1983		1984	
	Units	Value	Units	Value	Units	Value
TOTAL	NA	$295,038	NA	$295,240	NA	$250,114
WESTERN EUROPE						
Austria	570	2,572	310	1,987	432	1,375
Belgium-Luxembourg	4,521	11,826	4,066	7,284	4,631	6,594
Finland	373	2,772	306	2,257	251	837
Greece	283	5,495	311	1,333	NA	NA
Italy	3,533	12,937	4,143	14,213	4,116	9,406
Netherlands	1,399	3,295	1,939	1,804	1,870	3,003
Portugal	757	22,552	328	1,271	928	5,081
Spain	1,408	14,619	1,444	20,557	2,549	5,048
Sweden	972	2,421	855	3,693	1,344	2,492
Switzerland	3,984	12,468	2,059	8,714	2,849	8,777
Turkey	89	5,200	83	3,387	38	671
United Kingdom	3,840	16,363	3,212	14,932	3,104	10,945
West Germany	15,256	29,776	13,193	22,282	8,174	21,113
EASTERN EUROPE						
Czechoslovakia	23	2,460	NA	NA	23	1,340
East Germany	58	7,025	50	1,107	46	1,926
Rumania	NA	NA	10	4,272	87	3,845
U.S.S.R.	239	20,841	265	13,940	247	11,636
Yugoslavia	325	11,343	651	3,975	328	8,331
NORTH AND CENTRAL AMERICA						
Canada	492	1,345	1,039	3,421	1,270	7,531
Mexico	140	9,352	196	69,947	234	35,546
United States	3,593	11,024	2,372	17,082	6,124	23,427
SOUTH AMERICA						
Argentina	50	2,676	NA	NA	45	1,160
Venezuela	324	1,340	NA	NA	NA	NA
ASIA						
India	29	1,372	52	1,689	108	3,396
Iraq	672	6,994	110	2,427	NA	NA
Israel	296	1,569	331	2,508	183	3,881
Japan	510	915	529	1,213	641	1,364
People's Rep. of China	27	1,051	29	784	57	2,225
Saudi Arabia	1,099	3,241	1,735	2,056	2,101	4,379
Singapore	329	4,394	NA	NA	667	1,234
OCEANIA						
Australia	622	2,146	617	1,003	734	1,895
AFRICA						
Algeria	2,339	9,547	3,594	16,096	3,100	12,724
Egypt	222	4,514	865	3,410	777	2,045
Rep.of S. Africa	672	2,421	1,881	6,566	725	2,072
Tunisia	940	4,689	1,632	3,984	1,628	3,789
Franc Area(a)	2,717	7,124	3,095	7,794	1,307	5,791
OTHER	NA	35,359	NA	28,252	NA	35,235

NA - Not Available; exports, if any, are included in "Other."

Exchange Rate: 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs; 1984 $1 = 8.7401 Francs.

(a) Franc Area — 1982: Cameroon, Congo, Gabon & Ivory Cost; 1983: same as 1982 but also including Madagascar & Senegal; 1984: Cameroon, Congo, Gabon & Ivory Coast.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH IMPORTS OF MACHINE TOOLS
By Origin, Units and Value, 1982 to Date
(Values in Thousands of U.S. Dollars)

Destination	1982		1983		1984	
	Units	Value	Units	Value	Units	Value
TOTAL	257,060	$479,278	194,456	$351,056	101,288	$301,173
WESTERN EUROPE						
Austria	1,911	5,145	1,365	3,788	1,390	1,274
Belgium-Luxembourg	655	12,244	871	7,538	737	6,899
Denmark	2,878	1,069	2,236	1,376	1,718	943
Finland	59	182	118	245	105	427
Italy	13,478	98,904	9,990	60,176	12,697	54,170
Netherlands	14,332	4,782	8,070	2,997	1,461	3,003
Norway	13	419	8	120	6	43
Portugal	25	183	30	111	34	106
Spain	923	13,006	1,108	8,598	1,089	8,287
Sweden	1,357	4,552	1,434	5,510	1,439	2,813
Switzerland	2,168	50,721	2,994	47,384	1,958	46,277
United Kingdom	6,276	19,093	5,085	18,948	951	10,759
West Germany	29,114	156,968	19,875	119,618	17,380	99,114
EASTERN EUROPE						
Bulgaria	200	813	144	650	88	211
Czechoslovakia	123	3,011	77	1,806	66	914
East Germany	2,425	6,272	2,252	3,218	815	3,089
Hungary	23	1,638	2	232	7	84
Poland	2,687	972	1,810	1,662	40	358
Rumania	120	398	1,625	1,059	1,874	1,125
U.S.S.R.	289	1,921	266	2,061	209	1,052
Yugoslavia	54	279	25	149	32	136
NORTH AND CENTRAL AMERICA						
Canada	24	691	26	387	45	113
United States	4,261	35,971	1,172	17,918	1,471	14,251
ASIA						
India	20	302	6	35	7	47
Japan	2,813	45,728	2,703	36,320	1,015	35,963
Taiwan	169,421	6,818	130,177	5,045	53,867	5,182
OCEANIA						
Australia	1	96	1	2	NA	NA
OTHER	1,410	7,100	986	4,103	787	4,533

NA - Not Available; imports, if any, are included in "Other."

Exchange Rate: 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs; 1984 $1 = 8.7401 Francs.

Source: Syndicat des Constructeurs Français de Machines-Outils.

FRENCH FOREIGN TRADE IN MACHINE TOOLS
By Type of Machine, Units and Value, 1982 to Date
(Values in Thousands of U.S. Dollars)

Type of Machine	1982 Units	1982 Value	1983 Units	1983 Value	1984 Units	1984 Value
TOTAL IMPORTS	257,060	$479,278	194,456	$351,056	101,288	$301,173
Metal Cutting Total (including N/C)	246,636	348,125	183,410	252,683	91,306	205,620
Boring Machines (including N/C)	280	25,786	204	14,663	456	11,887
Boring Machines, N/C	91	15,783	51	9,364	319	6,215
Drilling Machines (including N/C)	47,248	34,100	42,539	23,832	32,353	19,639
Drilling Machines, N/C	164	17,939	120	11,031	167	11,543
Gear Cutting	119	7,792	113	7,368	216	4,496
Grinding & Polishing	185,138	64,848	130,304	48,906	45,781	38,277
Lathes (including N/C)	3,908	82,848	3,176	64,417	3,536	58,113
Lathes, N/C	888	48,442	653	41,115	656	41,908
Milling Machines (including N/C)	1,581	48,482	1,431	37,417	1,372	27,827
Milling Machines, N/C	249	23,602	302	21,808	311	17,396
Other Metal Cutting	8,362	84,269	5,643	56,079	7,588	45,380
Metal Forming Total	10,424	131,153	11,046	98,374	9,982	95,553
Hydraulic Presses, non-NC	494	6,370	353	5,751	553	4,716
Mechanical Presses, non-NC	1,123	23,897	1,249	20,271	961	19,574
Presses, N/C	45	2,004	51	3,312	49	1,606
Forging Machines	96	7,643	62	2,999	152	3,821
Punching, Shearing, Bending and Forming Machines	5,307	49,907	5,928	37,358	5,004	38,756
Wire Drawing Machines	195	7,107	186	7,925	256	6,035
Other Metal Forming	3,164	33,867	3,217	20,757	3,007	21,043
TOTAL EXPORTS	66,189	$390,482	64,004	$295,240	60,674	$250,114
Metal Cutting Total (including N/C)	50,238	183,365	50,205	207,173	47,051	164,534
Boring Machines (including N/C)	242	9,365	231	3,601	305	2,738
Boring Machines, N/C	38	2,831	68	890	755	783
Drilling Machines (including N/C)	9,179	9,803	12,494	15,277	8,436	8,620
Drilling Machines, N/C	273	2,528	371	6,115	142	1,938
Gear Cutting	89	1,101	90	4,113	97	1,090
Grinding & Polishing	10,613	38,743	12,044	79,809	15,408	52,724
Lathes (including N/C)	2,018	47,319	1,176	40,702	2,005	33,245
Lathes, N/C	221	19,558	235	20,901	271	12,983
Milling Machines(including N/C)	2,421	41,416	2,560	36,030	2,862	44,849
Milling Machines, N/C	138	18,401	152	17,543	273	28,020
Other Metal Cutting	25,676	35,619	21,610	27,641	17,938	21,268
Metal Forming Total	15,951	111,673	13,799	88,068	13,623	85,580
Hydraulic Presses, non-NC	343	3,887	317	4,110	387	3,633
Mechanical Presses, non-NC	2,304	24,455	983	13,190	1,730	11,376
Presses, N/C	1	6	26	1,229	15	367
Forging Machines	358	3,671	1,164	2,509	930	3,033
Punching, Shearing, Bending and Forming Machines	6,234	36,429	4,600	29,197	4,812	27,663
Wire Drawing Machines	189	7,151	112	3,200	116	6,329
Other Metal Forming	6,522	36,074	6,597	34,632	5,633	33,179

Exchange Rate: 1982 $1 = 6.5724 Francs; 1983 $1 = 7.6213 Francs; 1984 $1 = 8.7401 Francs.

Note: Individual items may not add to totals due to rounding.

Source: Syndicat des Constructeurs Français de Machine-Outils.

ITALIAN IMPORTS AND EXPORTS OF MACHINE TOOLS
By Origin and Destination, 1981 to Date
(Thousands of U.S. Dollars)

Countries	1981	1982	1983	1984
TOTAL IMPORTS	$300,325	$208,577	$181,788	$182,470
West Germany	112,864	79,926	65,644	75,583
Switzerland	47,855	38,299	43,390	34,548
United States	19,177	20,037	15,275	13,546
Japan	11,788	5,693	7,374	8,765
France	16,714	12,274	15,012	8,594
United Kingdom	15,482	8,059	6,782	7,570
Belgium-Luxemborg	3,079	3,475	2,304	5,122
East Germany	12,580	7,172	3,160	3,984
Sweden	4,310	7,172	4,411	3,870
Spain	11,788	6,137	2,963	3,187
Romania	2,815	1,405	132	2,960
U.S.S.R.	8,797	3,697	4,214	2,675
Austria	2,551	2,588	1,514	2,390
Netherlands	5,102	1,405	922	2,106
Other imports	25,423	11,238	8,691	7,570
TOTAL EXPORTS	$795,236	$639,852	$603,437	$557,997
West Germany	96,414	60,702	58,006	59,818
United States	46,183	42,588	39,110	57,826
France	116,646	89,464	92,771	54,013
U.S.S.R.	43,544	64,399	64,590	45,248
Turkey	17,418	10,499	24,361	28,002
United Kingdom	31,053	32,828	18,765	26,010
Switzerland	28,150	20,333	14,156	22,425
South Africa	39,058	19,298	14,946	17,473
Saudia Arabia	12,492	13,309	15,209	12,009
Egypt	3,167	8,872	6,979	10,928
Algeria	11,700	8,281	6,518	10,529
China	5,806	1,405	5,992	10,017
Sweden	13,459	13,974	9,284	9,789
Belgium-Luxemborg	9,325	8,577	11,061	9,676
Austria	8,621	6,950	8,362	8,879
Spain	19,881	19,667	10,732	8,253
Lybia	10,644	7,985	9,152	8,253
Poland	21,728	3,697	3,950	7,968
Greece	8,709	9,760	8,889	7,797
Canada	16,802	9,316	4,872	7,740
Other Exports	234,436	187,948	175,732	135,344

Exchange Rate: 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0 Lire.

Source: Unione Costruttori Italiana Macchine Utensili.

ITALIAN EXPORTS OF MACHINE TOOLS
1981 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1981(r)	1982(r)	1983	1984
TOTAL	$795,236	$639,852	$603,437	$557,997
Lathes	102,730	78,740	81,634	54,963
Boring Machines	73,498	54,687	48,082	35,825
Milling Machines	78,543	57,389	54,592	47,575
Drilling Machines	52,852	38,447	45,335	23,563
Broaching Machines	6,725	3,431	7,328	1,028
Grinding Machines	67,698	45,450	52,388	47,271
Other Abrasive Machines	43,474	32,677	30,227	NA
Gear Cutting Machines	2,790	3,026	3,737	2,337
Shaping-Sawing-Cutting off-slotting Machines	33,762	23,878	22,349	22,923
Presses	67,108	47,326	44,250	51,234
Shears and Punching Machines	20,954	27,351	23,688	21,306
Bending Machines	36,731	34,367	31,474	27,170
Forging Machines	2,870	3,839	5,213	4,892
All Others	205,487	189,276	153,140	217,910

r - Revised. NA - Not Available.

Exchange rates: 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.5 Lire; 1984 $1 = 1,757.0 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiana Macchine Utensili.

ITALIAN IMPORTS OF MACHINE TOOLS
1981 to Date
(Thousands of U.S. Dollars)

Machine Classifications	1981(r)	1982(r)	1983	1984
TOTAL	$300,325	$208,577	$181,788	$182,470
Lathes	61,736	34,265	25,959	30,887
Boring Machines	14,780	11,326	16,522	7,294
Milling Machines	36,650	22,828	10,927	13,966
Drilling Machines	12,738	7,016	6,023	6,775
Grinding Machines	26,538	23,757	25,645	22,516
Other Abrasive Machines	17,435	11,056	10,546	NA
Gear Cutting Machines	9,222	5,602	4,026	4,925
Shaping-Sawing-Cutting off-slotting Machines	11,161	7,903	5,698	6,506
Presses	23,638	18,902	13,434	12,178
Shears and Punching Machines	10,335	6,816	5,637	7,690
Bending Machines	11,696	7,531	5,094	4,929
Forging Machines	5,315	2,490	4,431	622
All Others	59,096	49,103	47,846	64,182

r - Revised. NA - Not Available.

Exchange rates: 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0 Lire.

Note: Individual items may not add to totals due to rounding.

Source: Unione Costruttori Italiana Macchine Utensili.

ITALIAN PRODUCTION, IMPORTS AND EXPORTS OF MACHINE TOOLS
By Weight and Value, 1970 to Date
(Weights in Thousands of Metric Tonnes and Values in Millions of U.S. Dollars)

Year	Shipments		Imports		Exports	
	Weight	Value	Weight	Value	Weight	Value
1970	188.0	$ 480.0	45.3	$123.8	58.9	$190.8
1971	186.0	516.2	45.9	159.9	61.8	186.0
1972	170.0	523.0	47.8	134.8	62.5	206.6
1973	162.0	620.9	55.6	187.0	57.2	236.4
1974	205.0	891.8	66.6	261.5	76.1	322.5
1975	160.0	842.5	45.0	212.9	75.7	432.1
1976	140.0	750.9	38.3	160.5	67.0	350.0
1977	146.5	878.3	39.6	192.9	76.5	442.4
1978	150.0	1,060.5	33.8	195.0	89.0	596.3
1979	160.0	1,354.0	36.7	255.9	91.4	689.0
1980	222.7	1,728.1	48.8	356.4	95.0	847.6
1981	NA	1,539.4	44.0	300.3	86.3	795.2
1982	NA	1,138.6	25.6	208.6	70.9	639.9
1983(r)	NA	1,037.0	NA	181.8	NA	603.4
1984	NA	996.0	NA	182.5	NA	558.0

r - Revised. NA - Not Available.

Exchange Rate: 1975 $1 = 552.85 Lire; 1976 $1 = 832.29 Lire; 1977 $1 = 882.39 Lire; 1978 $1 = 848.66 Lire; 1980 $1 = 856.45 Lire; 1981 $1 = 1,136.77 Lire; 1982 $1 = 1,352.5 Lire; 1983 $1 = 1,518.8 Lire; 1984 $1 = 1,757.0 Lire.

Source: Unione Costruttori Italiani Macchine Utensili.

SWEDISH PRODUCTION, IMPORTS, AND EXPORTS OF MACHINE TOOLS
Cutting & Forming, By Type of Machine, 1983 and 1984
(Thousands of U.S. Dollars)

Machine Classification	Production		Imports		Exports	
	1983 (r)	1984 E	1983	1984	1983	1984
GRAND TOTAL	$198,153	$212,288	$169,168	$167,208	$161,296	$163,565
Total Metal Cutting	84,119	93,087	91,196	93,320	59,439	72,519
Drilling Machines	6,194	9,430	3,223	7,648	5,112	8,156
Gear Cutting Machines	—	—	1,307	1,429	393	248
Grinding and Polishing	37,772	39,895	15,578	14,567	31,314	36,143
Lathes	22,287	24,299	22,195	19,773	13,431	14,536
Milling Machines	15,989	16,321	19,752	18,789	6,364	9,886
Broaching Machines	—	—	344	501	29	1,083
Planers and Shapers	—	—	17	64	63	34
Other Metal Cutting Machines	1,877	3,142	28,779	30,549	2,735	2,433
Total Metal Forming	58,715	64,798	38,382	34,528	55,035	52,372
Hammers	706	725	760	412	441	939
Presses inc. Forging Presses	15,873	19,343	5,165	4,673	21,211	18,457
Punching and Shearing Machines	8,627	10,880	13,994	11,340	10,715	9,555
Other Metal Forming Machines	33,509	33,850	18,463	18,103	22,669	23,421
Parts and Accessories	55,319	54,402	39,590	39,359	46,822	38,673

E - Estimate. r - Revised.

Exchange Rate: 1983 $1 = 7.661 Kronor; 1984 $1 = 8.2718 Kronor.

Source: The Swedish Machine Tool Manufacturers' Association.

SWEDISH IMPORTS AND EXPORTS OF MACHINE TOOLS
By Country, 1982 to Date
(Thousands of U.S. Dollars)

	Imports			Exports		
Country	1982	1983	1984	1982	1983	1984
TOTAL	$151,228	$129,578	$127,849	$138,465	$114,474	$124,891
Europe	122,126	105,173	97,042	83,522	79,899	83,771
Austria	(a)	1,048	1,869	(a)	2,591	1,311
Belgium	(a)	1,017	1,271	(a)	810	1,005
Denmark	4,572	3,963	3,782	7,831	5,593	7,687
Finland	2,356	1,679	1,730	10,153	8,965	7,224
France	2 240	3,366	1,965	4,896	5,725	1,880
Italy	19,305	9,561	13,059	7,060	4,881	6,458
Netherlands	(a)	1,915	1,624	(a)	2,838	2,960
Norway	(a)	299	583	7,797	7,278	6,825
Portugal	(a)	—	—	(a)	346	39
Spain	2,604	2,214	3,478	833	910	1,521
Switzerland	10,898	9,005	9,654	2,157	1,666	1,696
United Kingdom	8,501	12,794	6,083	9436	10,379	9,012
West Germany	57,897	53,895	47,442	12,421	12,373	18,128
East European Bloc	NA	4,372	4,403	NA	12,588	16,129
Czechslovakia	2,674	1,950	2,338	(a)	444	86
U.S.S.R.	3,064	395	472	9,432	10,563	11,650
Other East Bloc(b)	(a)	2,027	1,593	(a)	1,581	4,393
All Other Europe	8,014	45	98	11,507	2,957	1,897
United States	9,466	4,760	4,879	27,385	14,093	20,767
Canada	414	872	189	2,915	1,293	3,741
South & Central America	1	—	13	2,758	1,810	1,103
Japan	17,277	17,202	23,276	5,782	2,506	1,321
All Other Asia	1,920	1,571	2,283	11,715	12,233	10,996
Africa	21	—	—	3,087	1,798	2,168
Australia, New Zealand, West Samoa	4	—	—	1,299	814	974

NA - Not Available.

Exchange Rate: 1982 $1 = 6.2826 Kronor; 1983 $1 = 7.6671 Kronor; 1984 $1 = 8.2718 Kronor.

(a) Included in "All Other Europe."
(b) Includes Bulgaria, GDR, Hungary, Poland and Romania.

Note: Individual items may not add to totals due to rounding.

Source: The Swedish Machine Tool Manufacturers' Association.

NUMBER OF COMPANIES AND EMPLOYEES IN THE SWEDISH MACHINE TOOL INDUSTRY

	1979	1980	1981	1982(r)	1983(r)	1984
Number of Companies	40	40	38	36	36	35
Number of Employees	4,100	4,000	3,700	3,200	3,000	3,000

r - Revised.

Source: The Swedish Machine Tool Manufacturers' Association.

SWISS EXPORTS AND IMPORTS OF MACHINE TOOLS
1982 to Date
(Thousands of U.S. Dollars)

	Exports			Imports		
Country	1982	1983	1984	1982	1983	1984
GRAND TOTAL	$713,962	$670,890	$671,953	$157,674	$116,289	$130,409
Argentina	3,597	661	796	—	—	—
Australia	3,866	2,818	4,575	15	—	—
Austria	13,677	11,403	10,801	2,199	1,826	1,879
Belgium-Luxembourg	6,425	5,715	7,519	762	939	571
Brazil	6,388	3,055	2,028	216	1	—
Bulgaria	10,859	24,275	19,085	35	109	128
Canada	7,495	2,906	5,424	12	14	47
People's Rep. of China	30,584	23,779	14,568	18	2	—
Czechoslovakia	10,412	11,712	12,036	1,264	570	502
Denmark	3,358	2,940	5,758	1,305	616	1,000
East Germany	9,114	5,652	4,159	522	535	407
Finland	5,912	2,825	2,938	184	97	131
France	49,468	45,435	46,280	11,254	6,852	9,011
Hungary	3,340	3,932	2,222	472	394	355
India	14,323	15,020	13,970	119	3	185
Indonesia	4,811	1,926	3,748	—	—	—
Iraq	22,315	21,639	3,840	—	—	—
Israel	3,371	4,116	4,961	—	—	56
Italy	37,833	44,216	37,631	20,969	13,083	16,193
Japan	33,290	34,323	52,902	13,795	11,845	16,477
Mexico	5,378	1,560	3,666	—	—	—
Netherlands	8,585	9,566	12,676	2,370	1,453	2,031
Pakistan	916	1,606	2,016	—	—	—
Poland	6,016	8,110	7,003	207	45	1,329
South Africa	15,345	11,667	3,405	—	20	—
Spain	4,930	5,174	6,791	1,670	1,594	1,703
Sweden	10,696	7,870	9,549	2,074	2,073	1,141
Taiwan	5,187	6,625	7,918	344	510	920
United Kingdom	28,634	22,439	25,968	7,430	6,810	3,175
United States	73,039	61,397	93,240	8,816	1,489	1,912
U.S.S.R.	80,190	69,876	34,580	572	1,181	387
West Germany	146,286	142,035	145,132	79,849	63,035	70,077
Yugoslavia	14,512	19,027	13,305	237	32	7
All Other	34,726	35,590	51,414	955	1,161	785

Exchange Rate: 1982 $1 = 2.0303 Swiss Francs; 1983 $1 = 2.0991 Swiss Francs; 1984 $1 = 2.3497 Swiss Francs.

Note: Individual items may not add to totals due to rounding.

Source: Verein Schweizerischer Maschinen-Industrieller.

NETHERLANDS SALES OF MACHINE TOOLS AND PARTS
By Machine Types, 1978 to Date
(Thousands of U.S. Dollars)

Country	1978	1979	1980	1981	1982(p)	1983(p)
GRAND TOTAL	$54,631	$58,425	$67,854	$63,722	$47,674	$29,326
Metal Cutting Machine Tools	25,374	25,224	29,123	28,334	25,841	12,894
Metal Forming Machine Tools	23,202	26,820	32,594	27,172	17,040	12,158
Hydraulic Presses	4,345	4,038	6,438	11,743	4,045	1,261
Mechanical Presses	3,235	4,287	6,388			
Bending, Forming, Straightening, Cutting & Edging	2,773	2,941	2,364	1,844	4,831	6,061
Other Metal Forming	12,849	15,553	17,404	13,586	8,164	4,835
Metal Cutting Parts & Accessories	1,941	2,692	3,370	8,216	4,794	4,275
Metal Forming Parts & Accessories	4,114	3,689	2,766			
Metal Forming Parts & Accessories	4,114	3,689	2,766			

p - Preliminary.

Exchange Rate: 1978 $1 = 2.1636 Guilders; 1979 $1 = 2.006 Guilders; 1980 $1 = 1.9881 Guilders; 1981 $1 = 2.4952 Guilders; 1982 = 2.6702 Guilders; 1983 $1 = 2.8541 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal-Industrieen.

NETHERLANDS IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS
By Type of Machine, 1981 to Date
(Values in Thousands of U.S. Dollars)

	Imports			Exports		
Type of Machine	1981	1982	1983	1981	1982	1983
TOTAL	$168,443	$160,250	$127,010	$107,647	$101,303	$87,839
Lathes	25,008	17,152	14,085	5,130	4,232	4,730
Milling Machines	23,325	28,650	21,128	15,109	14,381	8,619
Grinding, Honing and Polishing Machines	16,351	14,868	12,193	15,069	15,130	11,142
Hydraulic Presses	3,887	4,232	1,612	3,847	3,258	4,695
Other Presses	3,286	3,033	2,242	761	899	1,892
Bending, Forming, Straightening, Cutting and Edging Machines	12,424	11,535	14,015	20,920	20,373	21,338
Other Metalworking Machine Tools	29,256	28,013	18,360	13,987	11,422	7,393
Parts and Accessories	54,905	52,768	43,376	32,823	31,608	28,030

Exchange Rate: 1981 $1 = 2.4952 Guilders; 1982 $1 = 2.6702 Guilders; 1983 $1 = 2.8541 Guilders.

Note: Individual items may not add to totals due to rounding.

Source: Vereniging Van Metaal-Industrieen.

CANADIAN IMPORTS AND EXPORTS OF MACHINE TOOLS AND PARTS

By Types of Machine, 1982 to Date

(Values in Thousands of U.S. Dollars)

	1982		1983		1984	
Machine Classifications	Units	Value	Units	Value	Units	Value
TOTAL IMPORTS	NA	$328,685	NA	$270,738	NA	$358,617
Boring Machinery & Parts	272	25,671	142	15,167	182	12,741
Drilling Machinery & Parts	12,263	10,784	17,224	9,559	15,328	14,622
Grinding Machinery & Parts	53,463	26,546	114,131	22,313	90,032	33,021
Automatic Lathes	410	27,096	583	20,936	893	27,714
Turret Lathes, N.E.C.	2,404	2,041	520	1,724	423	1,064
Lathes & Parts, N.E.C.	861	15,095	938	11,323	1,159	14,489
Milling Machines & Parts	1,039	20,825	1,195	21,574	1,425	20,272
Shapers, Gear Makers & Parts	703	19,074	525	8,018	519	12,164
Transfer Machines & Parts	43	26,451	10	18,734	12	37,143
Sawing Machines & Parts	NA	11,167	NA	10,400	NA	13,377
Metalworking Presses & Parts	915	25,024	889	26,379	1,912	34,963
Rolls, Bending Machines & Parts	NA	12,882	NA	7,774	NA	12,019
Shearing Machines & Parts	234	6,180	175	2,260	510	3,471
Metal Forging Stamping Machines & Parts	88	12,279	97	5,342	167	8,080
Can Making Machinery & Parts	NA	23,789	NA	34,478	NA	34,401
Machine Tools & Parts, N.E.C.	NA	63,782	NA	54,757	NA	79,076
TOTAL EXPORTS(a)	NA	$154,458	NA	$55,562	NA	$119,350
Boring, Drilling Machinery & Parts	430	7,653	145	1,522	848	6,187
Grinding Machinery & Parts	91	2,840	240	3,743	352	2,502
Lathes & Parts	157	6,025	312	3,849	330	5,291
Metalworking Presses & Parts	157	5,040	185	7,963	179	7,194
Machine Tools & Parts, N.E.C.	NA	132,900	NA	38,485	NA	98,176

NA - Not Available. N.E.C. - Not Elsewhere Classified.

(a) Domestic exports; does not include re-exports by Canada.

Exchange rate: 1982 $1 = 1.2337 Canadian dollars; 1983 $1 = 1.2324 Canadian dollars; 1984 $1 = 1.2951 Canadian dollars.

Source: Statistics Canada.

THE INDIAN MACHINE TOOL INDUSTRY
Production and Exports
(Values in Thousands of U.S. Dollars)

	Production						Exports	
	1982		1983		1984		1984	
Type of Machine	Unit	Value	Unit	Value	Unit	Value	Unit	Value
Total Machine Tools	10,187	$181,650	9,925	$169,106	9,465	$164,333	1,063	$134,977
Boring machines	118	12,155	110	13,099	98	11,272	2	4,315
Drilling machines	1,371	8,568	1,697	8,640	1,200	9,231	99	10,387
Milling machines	1,140	18,129	1,112	17,440	1,161	17,681	162	35,192
Gear cutting machines	118	3,415	73	4,131	28	2,573	(a)	(a)
Broaching machines	10	551	13	734	16	853	(a)	(a)
Lapping, honing, polishing machines	30	799	57	163	47	62	2	53
Automatic screw machines	656	15,277	562	14,496	555	15,798	32	13,440
Lathes	3,837	36,401	3,341	30,829	3,412	33,835	466	27,775
Grinding machines	927	14,958	981	14,314	783	13,462	103	11,296
Sawing machines	198	715	160	781	228	605	61	524
Shaping machines	186	1,967	182	2,330	160	3,287	13	909
Slotting machines	146	904	33	625	53	1,897	7	506
Screwing & threading	73	1,462	84	1,610	49	961	11	823
Presses	385	18,779	374	14,787	445	16,750	34	17,656
Shearing & sheet metal	183	5,765	313	5,882	187	5,660	16	9,781
Other	811	41,805	833	39,245	1,043	30,406	55	2,320

(a) Included in "Other."

Exchange Rate: 1982 $1 = 9.455 Rupee; 1983 $1 = 10.099 Rupee; 1984 $1 = 11.363 Rupee.

Source: Indian Machine Tool Manufacturers' Association (IMTMA)

TAIWAN'S PRODUCTION, IMPORTS, EXPORTS AND CONSUMPTION OF MACHINE TOOLS
By Type of Machine, 1983
(Thousands of U.S. Dollars)

Machine Classification	Production	Imports	Exports	Consumption
Grand Total	$210,962	$112,987	$135,361	$188,588
Boring Machines	484	5,806	198	6,093
Drilling Machines	56,653	5,428	50,737	11,343
Milling Machines	36,001	10,891	18,395	28,497
Lathes	50,687	9,753	33,518	26,922
Gear-making Machines	437	3,205	76	3,566
Grinding Machines	14,179	7,980	7,326	14,834
Machining Centers	8,054	4,488	3,927	8,615
Sawing Machines	10,264	2,072	9,386	2,950
Presses	12,382	24,072	2,577	33,876
Planing Machines	2,658	467	486	2,638
Other Machinery	19,163	38,825	8,735	49,253

Exchange Rate: $1 = 39.0 NT$.

Source: World Trade Promotion Corp., Taiwan.

TAIWAN IMPORTS OF MACHINE TOOLS, 1983
By Type of Machine; Major Countries of Destination

(Values in Thousands of U.S. Dollars)

Type of Machine	Japan	France	West Germany	Switzerland	United States	World Total
Grand Total						
Units	4,504	25	115	73	138	5,246
Value	$71,248	$5,061	$12,923	$5,269	$5,794	$112,987
Boring Machines						
Units	57	—	4	8	—	79
Value	$ 2,868	—	$ 1,995	$ 400	—	$ 5,806
Drilling Machines						
Units	286	10	3	1	21	347
Value	$ 735	$ 7	$ 322	$1,392	$2,606	$ 5,428
Milling Machines						
Units	127	5	10	—	13	205
Value	$ 5,870	$ 395	$ 3,496	—	$ 245	$ 10,891
Lathes						
Units	357	—	26	12	11	461
Value	$ 6,451	—	$ 1,866	$ 503	$ 55	$ 9.753
Gear Grinding						
Units	39	—	9	—	—	56
Value	$ 2,023	—	$ 831	—	—	$ 3,205
Grinding Machines						
Units	146	—	19	18	13	249
Value	$ 4,306	—	$ 1,587	$ 484	$ 292	$ 7,980
Universal Machining Centers						
Units	36	—	—	1	2	39
Value	$ 3,590	—	—	$ 246	$ 652	$ 4,488
Sawing Machines						
Units	94	1	3	—	8	153
Value	$ 1,037	$ 5	$ 33	—	$ 902	$ 2,072
Presses						
Units	514	—	7	9	15	565
Value	$22,305	—	$ 289	$ 674	$ 434	$ 24,072
Planing Machines						
Units	7	—	1	—	—	14
Value	$ 432	—	$ 7	—	—	$ 467
All Other						
Units	2,841	9	33	24	55	3,078
Value	$21,634	$4,654	$ 2,497	$1,571	$ 609	$ 38,825

Exchange Rate: $1 = 39.0 NT$.

Source: World Trade Promotion Corp., Taiwan.

TAIWAN EXPORTS OF MACHINE TOOLS, 1983

By Region

(Values in Thousands of U.S. Dollars)

Type of Machine	World Total	Asia	Europe	Africa	North America	All Other
Grand Total						
Units	718,798	23,606	127,312	16,281	504,686	46,913
Value	$135,361	$23,131	$17,862	$3,825	$80,145	$10,398
Boring Machines						
Units	8	5	—	—	3	—
Value	$ 198	$ 8	—	—	$ 190	—
Drilling Machines						
Units	628,960	18,069	119,628	13,462	436,081	41,720
Value	$ 50,737	$ 2,295	$10,764	$1,463	$32,245	$ 3,972
Milling Machines						
Units	6,236	712	203	35	4,985	301
Value	$ 18,395	$ 2,328	$ 588	$ 155	$14,528	$ 796
Lathes						
Units	12,561	2,120	1,360	378	6,750	1,953
Value	$ 33,518	$ 8,276	$ 3,095	$ 826	$17,474	$ 3,846
Gear Making						
Units	15	14	—	—	—	1
Value	$ 76	$ 73	—	—	—	$ 3
Grinding Machines						
Units	2,105	341	78	42	1,576	68
Value	$ 7,326	$ 1,288	$ 328	$ 245	$ 5,134	$ 331
Machining Centers						
Units	94	4	38	—	49	3
Value	$ 3,927	$ 141	$ 1,464	—	$ 2,272	$ 50
Sawing Machines						
Units	65,425	957	5,823	2,171	53,873	2,601
Value	$ 9,386	$ 452	$ 949	$ 402	$ 6,954	$ 629
Presses						
Units	217	168	—	11	33	5
Value	$ 2,577	$ 2,182	—	$ 245	$ 104	$ 45
Planing Machines						
Units	139	109	2	8	—	20
Value	$ 486	$ 378	$ 4	$ 24	—	$ 79
All Other						
Units	3,038	1,107	180	174	1,336	241
Value	$ 8,735	$ 5,707	$ 671	$ 465	$ 1,245	$ 647

Exchange Rate: $1 = 39.0 NT$.

Source: World Trade Promotion Corp., Taiwan.

TAIWAN EXPORTS OF MACHINE TOOLS, 1983
By Country
(Values in Thousands of U.S. Dollars)

Type of Machine	United States	Australia	Canada	West Germany	United Kingdom	Japan
Grand Total						
Units	463,864	35,411	40,745	33,442	15,224	2,665
Value	$73,666	$6,801	$6,113	$4,365	$3,778	$3,413
Boring Machines						
Units	2	—	1	—	—	—
Value	$ 84	—	$ 106	—	—	—
Drilling Machines						
Units	399,957	31,373	36,115	31,665	11,433	1,951
Value	$29,482	$2,795	$2,752	$2,871	$1,232	$ 641
Milling Machines						
Units	4,767	174	213	26	104	81
Value	$13,753	$ 484	$ 758	$ 77	$ 229	$ 349
Lathes						
Units	5,978	1,578	734	409	192	418
Value	$15,805	$2,643	$1,541	$ 719	$1,058	$2,063
Gear Making						
Units	—	1	—	—	—	—
Value	—	$ 3	—	—	—	—
Grinding Machines						
Units	1,492	47	68	12	6	42
Value	$ 4,754	$ 241	$ 294	$ 116	$ 13	$ 185
Machining Centers						
Units	48	2	1	1	17	—
Value	$ 2,210	$ 39	$ 62	$ 132	$ 732	—
Sawing Machines						
Units	50,374	2,049	3,495	1,328	3,433	116
Value	$ 6,428	$ 456	$ 520	$ 205	$ 459	$ 28
Presses						
Units	30	1	3	—	—	—
Value	$ 102	$ 15	$ 3	—	—	—
Planing Machines						
Units	—	4	—	—	—	3
Value	—	$ 12	—	—	—	$ 22
All Other						
Units	1,216	182	115	1	39	54
Value	$ 1,048	$ 115	$ 78	$ 246	$ 56	$ 124

Exchange Rate: $1 = 39.0 NT$.

Source: World Trade Promotion Corp., Taiwan.

CZECHOSLOVAK PRODUCTION OF MACHINE TOOLS
By Type of Machine, in Units, 1970 to 1975

Type of Machine	1970	1971	1972	1973	1974	1975
GRAND TOTAL	44,342	47,230	44,454	38,852	38,788	38,572
Metal Cutting Total	35,186	39,568	36,910	31,653	30,188	29,660
Boring Machines	582	580	594	572	558	558
Drilling Machines	6,167	5,853	5,024	NA	NA	NA
Grinding Machines	13,581	17,450	15,686	12,333	11,923	11,917
Lathes						
Center Type	5,833	6,141	6,372	6,327	5,941	5,808
Automatic & Semi-Automatic	1,431	1,447	1,530	1,290	1,254	1,226
Milling Machines	2,894	3,149	3,185	2,847	2,627	2,440
Other Metal Cutting	4,698	4,938	4,520	NA	NA	NA
Metal Forming Total	9,156	7,662	7,544	7,199	8,600	8,912
Power Presses	1,356	1,253	1,532	1,763	1,692	1,919
Other Metal Forming	7,800	6,409	6,012	5,436	6,908	6,993

NA - Not Available.

Sources: Czechoslovakia Statistical Abstract - 1971 and Statistical Survey of Czechoslovakia 1977.

CZECHOSLOVAK IMPORTS AND EXPORTS OF MACHINE TOOLS
In Units, for Selected Years, 1965 to 1982

	Imports			Exports
Year	Total	Metal Cutting	Metal Forming	Total Machine Tools
1965	4,603	3,915	688	13,572
1967	4,184	3,582	602	15,114
1968	5,770	4,972	798	12,749
1969	6,310	5,607	703	17,411
1970	8,020	6,670	1,350	10,953(a)
1971	9,426	8,350	1,076	13,191
1972	9,589	8,422	1,167	12,108
1973	6,969	6,017	952	10,139(a)
1974	10,624	7,806	2,818	9,689(a)
1975	9,753	7,850	1,903	11,320(a)
1976	8,229	6,789	1,440	11,640(a)
1977	13,445	12,235	1,209	9,535(a)
1978	NA	NA	NA	NA
1979	NA	NA	NA	NA
1980	12,763	11,002	1,761	10,104(a)
1981	7,452	6,534	918	11,260(a)
1982	9,927	8,161	1,766	8,971(a)

NA - Not Available.

(a) Metal Cutting Machines only.

Sources: Facts On Czechoslovak Foreign Trade (annual) and Czechoslovakia Statistical Abstract - 1971.

CZECHOSLOVAK IMPORTS AND EXPORTS OF METALWORKING MACHINERY
By Selected Origin and Destination, 1981 and 1982
(Thousands of U.S. Dollars)

	Imports		Exports	
	1981	1982	1981	1982
TOTAL	$240,300	$217,299	$479,257	$465,912
WESTERN EUROPE				
Austria	1,420	1,741	3,108	1,582
Belgium	1,256	383	2,562	1,773
Denmark	(b)	(b)	1,579	942
France	1,221	3,122	3,809	3,254
Italy	4,935	2,380	11,274	6,481
Netherlands	(b)	(b)	2,474	1,420
Norway	(b)	(b)	1,560	1,524
Spain	100	202	2,880	1,677
Sweden	451	2,040	4,149	2,807
Switzerland	11,814	10,745	6,699	2,658
United Kingdom	1,900	3,802	3,208	991
West Germany	19,000	20,336	15,002	6,340
EASTERN EUROPE				
Bulgaria	9,533	7,175	22,473	20,912
East Germany	50,455	47,346	38,649	30,979
Hungary	15,460	11,830	25,676	31,860
Poland	15,022	12,677	24,570	22,982
Rumania	22,384	21,854	25,023	24,514
U.S.S.R.	51,444	38,451	124,863	161,740
Yugoslavia	9,755	11,629	15,510	15,701
NORTH AND CENTRAL AMERICA				
Canada(a)	(b)	(b)	8,043	2,757
Cuba	(b)	(b)	885	2,101
Mexico	(b)	(b)	8,869	4,885
USA(a)	(b)	(b)	5,510	2,834
SOUTH AMERICA				
Argentina	(b)	(b)	(b)	(b)
Brazil	(b)	(b)	1,175	167
Peru	(b)	(b)	2,692	1,070
Venezuela	(b)	(b)	(b)	(b)
ASIA				
Algeria	(b)	(b)	1,870	3,149
Egypt	(b)	(b)	1,364	2,350
India	(b)	(b)	4,133	5,030
Iran	(b)	(b)	2,826	8,329
Japan	(b)	(b)	4,839	1,093
No. Korea(a)	3,041	2,116	305	345
Syria	(b)	(b)	2,046	1,109
Turkey	(b)	(b)	534	1,968
PACIFIC				
Australia(a)	(b)	(b)	3,029	556
New Zealand(a)	(b)	(b)	1,089	234
ALL OTHER COUNTRIES	21,109	19,471	94,580	87,796

(a) Includes metal cutting only.
(b) Imports or exports, if any, are included in "All other Countries."

Exchange Rate: 1981 $1 = 5.8 Czechoslovak Crowns; 1982 $1 = 6.09 Czechoslovak Crowns.

Source: Facts on Czechoslovak Foreign Trade - 1983.

U.S.S.R. INDUSTRIAL PRODUCTION
For Selected Products and Industries, 1980 to 1982

	Unit of Measure	1980	1981	1982
MACHINE TOOL INDUSTRY				
Metal Cutting Machines	Thousands	216	205	195
Metal Cutting Machines(a)	Mill. Rubles	1,944	1,955	2,068
Metal Cutting Machines, NC	Units	8,848	10,100	10,600
Presses—Forging Machines	Thousands	57	57	57
Presses—Forging Machines(a)	Mill. Rubles	563	599	612
OTHER SELECTED PRODUCTS AND INDUSTRIES				
Electric Power	Bill. Kwh	1,294	1,326	1,366
Petroleum	Mill. Tons	603	609	613
Gas	Bill. Cu. Meters	435	465	501
Coal Incl. Coking Coal	Mill. Tons	716	704	718
Cast Iron	Mill. Tons	107	108	107
Steel	Mill. Tons	148	148	147
Rolled Ferrous Metal	Mill. Tons	118	118	117
Steel Pipe	Mill. Meters	2,609	2,640	2,591
Steel Pipe	Mill. Tons	18	18	18
Iron Ore	Mill. Tons	245	242	244
Instruments & Automation Equip. with Spare Parts(a)	Mill. Rubles	5,400	4,400	4,800
Computing Equip. with Spare Parts(a)	Mill. Rubles	4,500	2,700	2,900
Automobiles	Thousands	1,327	1,324	1,307

(a) 1980 data in 1975 wholesale prices; 1981 and 1982 wholesale prices.

Source: U.S.S.R. Central Statistical Administration.

As the exchange rate of the ruble is controlled, value figures are given in rubles.

The official exchange rate: 1980 $1 = .649 rubles; 1981 $1 = .719 rubles; 1982 $1 = .825 rubles.

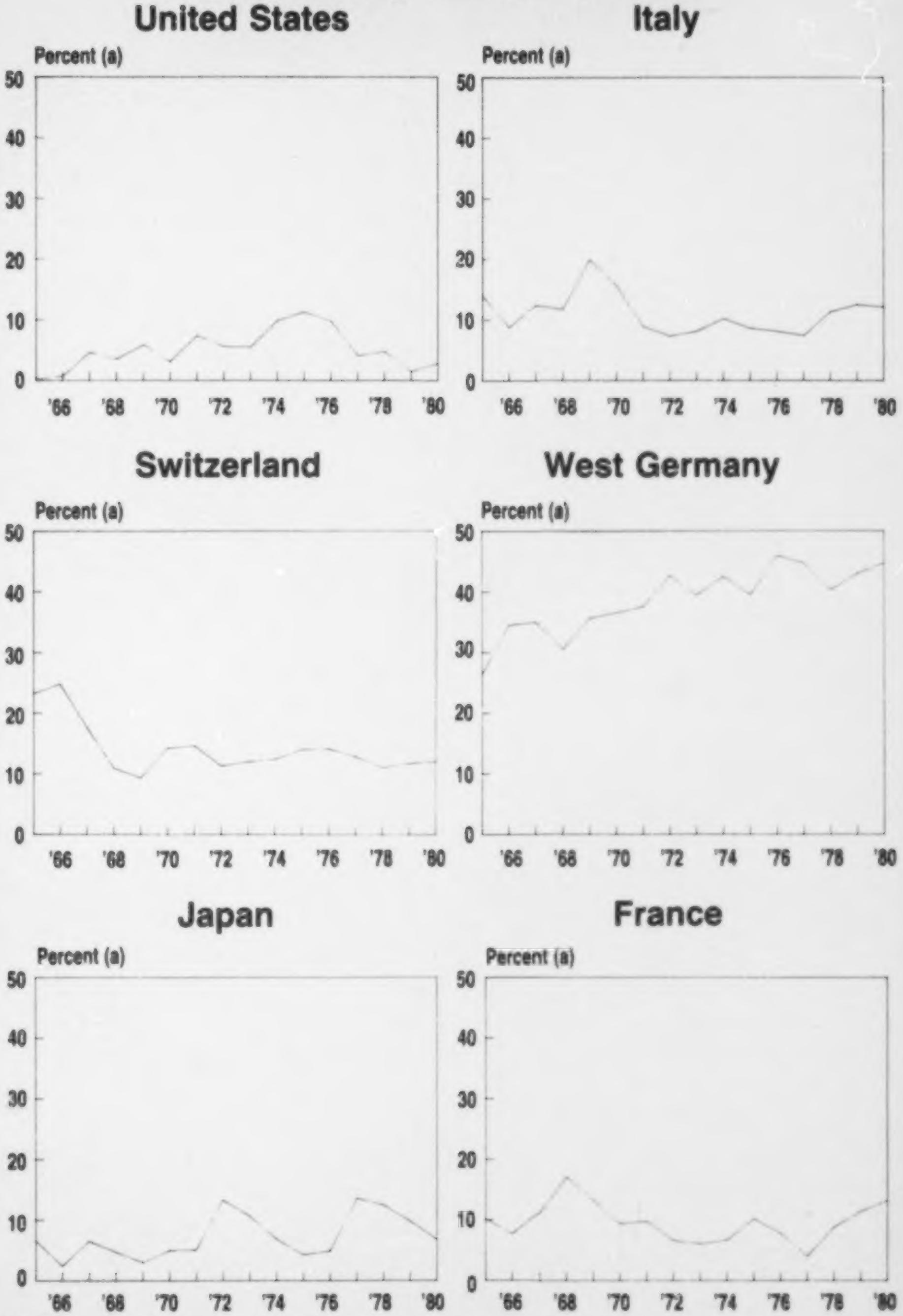
U.S.S.R. PRODUCTION OF MACHINE TOOLS
Units For Selected Years, 1937 to 1982

Year	Metal Cutting Machine Tools	Forging Machines & Presses	Year	Metal Cutting Machine Tools	Forging Machines & Presses
1937	48,500	3,125	1970	202,300	41,268
1940	58,400	4,668	1971	207,000	42,300
1945	38,400	2,871	1972	211,000	44,000
1950	70,600	7,684	1973	214,000	46,500
1955	117,100	17,117	1974	224,000	48,900
1960	155,900	29,933	1975	231,000	50,500
1961	165,000	30,520	1976	232,000	51,900
1962	176,800	33,434	1977	236,000	54,300
1963	182,700	34,221	1978	236,000	55,400
1964	184,400	34,497	1979	231,000	55,200
1965	186,100	34,637	1980	216,000	57,200
1966	192,200	38,412	1981	205,000	57,100
1967	197,000	41,126	1982	195,000	57,300
1968	200,600	42,128			
1969	205,300	42,658			

Source: The U.S.S.R. in Figures for 1983—U.S.S.R. Central Statistical Administration.

Eastern Bloc Machine Tool Imports

From Six Leading Non-Communist Nations



(a) Percent of total Eastern Bloc imports from non-communist countries.

Source: U.S. Dept. of Commerce.

EASTERN BLOC (a) MACHINE TOOL IMPORTS FROM 14 MAJOR NON-COMMUNIST TRADING NATIONS (b)

Total and Selected Nations, 1962 to 1983

(Values in Millions of U.S. Dollars)

Year	Total	United States		France		West Germany(e)		Italy		Japan		Switzerland	
		Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)	Value	% (c)
1962	$ 47.4	$ .5	1.1%	$ 4.0	8.4%	$ 16.2	34.2%	$ 11.3	23.8%	$ 1.0	2.1%	I$ 5.7	12.0%
1963	67.4	.3	.4	6.3	9.3	19.0	28.2	12.9	19.1	2.8	4.2	7.7	11.4
1964	68.7	.2	.3	9.0	13.1	19.4	28.2	12.0	17.5	3.1	4.5	10.9	15.9
1965	60.9	.1	.2	6.2	10.2	16.0	26.3	8.5	14.0	4.0	6.6	14.1	23.2
1966	71.3	.5	.7	5.5	7.7	24.6	34.5	6.3	8.8	1.7	2.4	17.7	24.8
1967	93.6	4.3	4.6	10.5	11.2	32.8	35.0	11.6	12.4	6.1	6.5	16.5	17.6
1968	162.7	5.7	3.5	27.9	17.1	49.6	30.5	19.1	11.7	7.6	4.7	17.8	10.9
1969	307.3	18.1	5.9	40.9	13.3	109.3	35.6	61.1	19.9	9.3	3.0	28.7	9.3
1970	257.9	8.0	3.1	24.2	9.4	94.2	36.5	40.3	15.6	12.8	5.0	36.5	14.2
1971	201.2	14.8	7.4	19.8	9.8	75.5	37.5	18.0	8.9	10.2	5.1	29.3	14.6
1972	385.5	21.5	5.6	25.4	6.6	164.3	42.6	28.3	7.3	51.2	13.3	43.6	11.3
1973	597.8	32.6	5.5	36.5	6.1	235.7	39.4	48.6	8.1	63.9	10.7	71.5	12.0
1974	727.4	72.2	9.9	48.6	6.7	309.2	42.5	74.2	10.2	50.4	6.9	89.9	12.4
1975	899.6	102.1	11.3	82.1	10.2	355.2	39.5	77.6	8.6	38.7	4.3	125.9	14.0
1976	976.8	63.8	9.8	76.6	7.8	447.9	45.9	79.6	8.1	48.3	4.9	138.0	14.1
1977	1,127.8	46.6(d)	4.1	45.6	4.0	504.6	44.7	83.7	7.4	153.7	13.6	144.9	12.8
1978	1,331.3	63.3(e)	4.8	116.7	8.8	536.8	40.3	150.0	11.3	165.9(f)	12.5	145.9	11.0
1979	1,243.8	18.5(d)	1.5	141.9	11.4	534.9	43.0	155.6	12.5	111.8	9.8	145.9	11.7
1980	1,145.6	32.3(e)	2.8	151.4	13.2	511.8	44.7	138.3	12.1	78.4	6.8	137.6	12.0

(a) Bulgaria, Czechoslovakia, E. Germany, Hungary, Poland, Rumania, and U.S.S.R.
(b) United States, Austria, Belgium-Luxembourg, Canada, Denmark, France, Federal Republic of Germany, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, and United Kingdom.
(c) Percent of total Eastern Bloc machine tool imports from non-communist countries.
(d) Does not include Bulgarian imports.
(e) Does not include East German imports.
(f) Does not include Czechoslovakian imports.

Source: U.S. Dept. of Commerce, "Market Share Reports", Commodity Series, Machine Tools for Working Metals; and NMTBA.

METAL CUTTING (a) MACHINE TOOL PRODUCTION (c)
U.S. and Selected Communist Countries
For selected years, 1960–1983

	1960	1970	1975	1977	1978	1979	1980(r)	1981(r)	1982 (r)	1983
United States (b)										
Million US $	$539.30	$1,097.70	$1,790.40	$1,789.40	$2,139.00	$2,900.00	NA	NA	NA	NA
Thousand units	42.91	49.31	64.32	59.40	58.12	76.07	61.37	72.01	49.10	35.4
Communist Countries										
USSR and Eastern Europe										
USSR										
Million US $	$611.74	$1,427.88	$2,179.78	$2,556.49	$2,805.78	$2,959.87	NA	NA	NA	NA
Thousand units	155.92	202.16	231.35	237.56	237.88	230.00	216.00	205.00	195.00	190.00
Bulgaria (thousand units)	3.15	13.94	16.28	13.74	15.32	16.47	18.87	18.67	17.90	19.10
Czechoslovakia(thousand units)	30.23	35.19	29.66	37.61	34.25	35.66	36.90	34.70	37.10	50.00
East Germany (thousand units)	41.90	22.22	19.72	18.76	19.33	18.42	17.50	16.80	18.00	19.00
Hungary (thousand units)	9.78	14.48	12.83	15.27	12.69	12.06	10.20	10.90	12.80	14.00
Poland (thousand units)	22.47	29.73	33.19	23.18	30.00	30.86	28.20	30.50	31.50	32.00
Romania (thousand units)	4.44	14.14	28.27	30.07	27.55	27.19	29.40	36.70	37.90	39.00
China (thousand units)	NA	140.00	175.00	200.00	180.00	140.00	134.00	103.00	100.00	118.00

NA - Not Available. r - Revised.

(a) Power-driven metal cutting machines that are not portable by hand and are used to remove metal in the form of chips; these machines include planers and milling, honing, lapping, grinding, electro-erosion, and ultrasonic cutting machines.

(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1984."

METAL FORMING MACHINE TOOL (a) PRODUCTION (c)
U.S. and U.S.S.R.
For selected years, 1960–1983

	1960	1970	1975	1977	1978	1979	1980	1981	1982	1983
United States										
Million US$	$238.4	$454.1	$ 615.7	$651.3	$784.7	$990.3	NA	NA	NA	NA
Thousand units(b)	19.3	24.2	26.8	32.5	29.5	31.4	30.3	21.7	18.3	31.5
USSR										
Million US$	$188.3	$359.2	$ 581.1	$706.6	$776.7	$828.6	NA	NA	NA	NA
Thousand units	23.9	41.3	50.5	54.3	55.4	56.3	57.2	57.1	57.3	57.5

NA - Not Available.

(a) Power-driven metal forming machine tools that are not supported in the hands of an operator when in use and are designed to press, forge, emboss, hammer, extrude, blank, spin, shear, and bend metal into shape.

(b) Average value of $1,000 and over for 1960-77 and beginning in 1978, $2,500 and over.

(c) The data above are only available through the C.I.A. whose sources are confidential.

Source: C.I.A. "Handbook of Economic Statistics, 1984."

COMMUNIST COUNTRIES' EXPORTS OF MACHINERY (a)
1973 to 1977
(Millions of U.S. Dollars)

		Exported to					
Exporting Country	Total(b)	Communist Countries (c)	Free Europe (Incl. Yugosl.)	U.S., Canada, Japan	Africa (Excl. S. Afr.)	Asia (d)	Latin American (e)
TOTAL							
1973	$ 9,143	$ 6,917	$638	$48	$298	$ 867	$284
1974	10,606	8,228	759	71	319	986	88
1975	12,401	9,323	929	80	341	1,067	117
1976	14,050	11,130	580	40	218	587	97
1977	15,605	12,726	665	45	250	785	110
U.S.S.R.							
1973	2,718	1,541	245	3	170	491	182
1974	3,357	2,249	232	10	154	555	11
1975	3,553	2,051	252	17	136	540	22
1976	3,953	2,952	127	3	96	303	23
1977	4,759	3,538	153	3	115	28	
East Germany							
1973	2,254	1,959	123	11	45	78	37
1974	2,507	2,181	152	12	42	92	26
1975	2,972	2,615	169	9	36	114	24
1976	3,458	2,957	135	4	50	104	25
1977	3,833	3,328	150	5	54	104	27
Czechoslovakia							
1973	1,774	1'404	128	16	54	134	35
1974	1,973	1,511	169	22	81	153	32
1975	2,303	1,776	195	20	106	162	41
1976	2,700	2,032	130	8	38	113	28
1977	2,972	2,237	143	9	41	124	32
Poland							
1973	578	438	68	9	10	48	5
1974	641	454	96	17	9	54	10
1975	836	576	145	19	14	63	19
1976	1,124	855	91	12	12	54	13
1977	1,335	1,015	109	14	14	64	15
Hungary							
1973	587	514	22	1	3	41	6
1974	689	597	35	1	3	49	5
1975	910	749	74	1	5	77	4
1976	895	752	33	1	3	31	5
1977	1,055	886	38	1	3	37	6
Romania							
1973	388	269	34	7	11	59	8
1974	437	293	49	8	22	61	3
1975	561	372	58	13	30	83	4
1976	440	215	37	13	15	58	2
1977	495	242	42	14	16	65	2
Bulgaria							
1973	844	792	18	1	5	16	11
1974	1.002	943	26	1	8	22	1
1975	1,266	1,185	36	1	13	30	1
1976	1,481	1,358	27	1	6	23	1
1977	1,615	1,480	30	1	6	26	1

(a) Note that these figures are for machinery in general and not for machine tools only.

(b) Total includes Australia, New Zealand, South Africa and not specified.

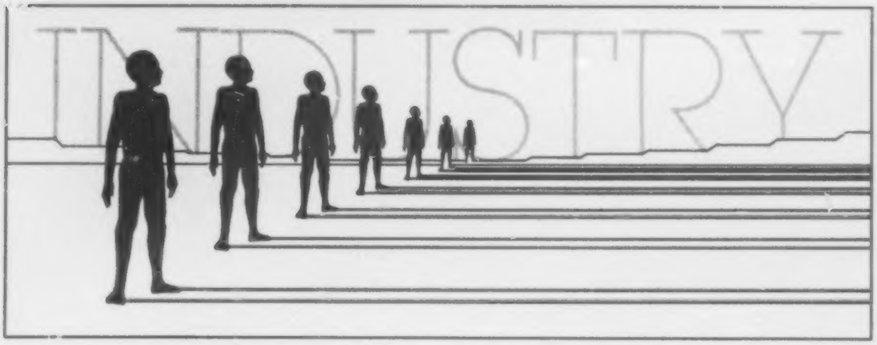
(c) U.S.S.R., East Germany, Czechoslovakia, Poland, Hungary, Romania, Bulgaria, Albania; beginning with 1974 includes Cuba and Outer Mongolia.

(d) Excluding Japan; beginning with 1974 excludes Outer Mongolia.

(e) Beginning with 1974 excludes Cuba.

Source: Verein Deutscher Maschinenbau-Anstalten, VDMA, "Statistisches Handbuch für den Maschinenbau" (annually).

The future of industry depends on new employees



Put NMTBA's new career recruitment film to work for you. "Machine Tool Careers" is available *free of charge* for use in your company's personnel development efforts, as well as in local high schools and vocational schools. The informative 25-minute film is also available in video cassette.

This colorful film shows young, successful metalworking industry employees—operators, programmers, assembly technicians, service engineers and supervisors—describing their work, their career progress and their life styles. In addition, the motion picture covers what machine tools are and their importance to our nation's industrial achievements.

Collateral handout materials to reinforce the film's message are also available free of charge. To arrange for free loan of the career information film, contact Modern Talking Picture Service, Inc., Scheduling Center, 5000 Park Street North, St. Petersburg, Florida 33709.

national machine tool builders association

"Machine Tool Careers"—*an investment in the future.*

7

EMPLOYMENT AND EARNINGS

If all the employees of the U.S. machine tool industry were to work for a single company, it would rank only about fortieth among U.S. industrial corporations in total employment. Clearly, relative to total U.S. Industry, the machine tool industry is small. These employment statistics demonstrate that the industry is characterized by a substantial number of small and medium-sized establishments.

Historically, industry employment has fluctuated sharply with changes in new orders and shipments. Evidence of this is provided not only by the employment statistics but also by the labor turnover data in this chapter. These fluctuations create serious problems for the industry and for its employees. If employment has to be cut drastically, some of the highly skilled labor force is lost. Conversely, when business experiences a quick upturn, there is a shortage of skilled workers. Extensive overtime is characteristic of the industry when orders are high.

To fill the gap in skilled workers, the industry sponsors training programs and NMTBA's Training Director assists Association members in solving a variety of manpower problems. However, the work force is getting older and it is becoming increasingly difficult to maintain a core of skilled workers.

Wages in the industry are competitive with those in comparable industries. Average hourly earnings for production workers in the metal cutting machine tool segment were $10.20 in 1984. Average earnings in the metal forming sector of the industry were $10.61. The average weekly hours worked in the industry were 42.4 for both metal cutting and metal forming machine tool builders' employees.

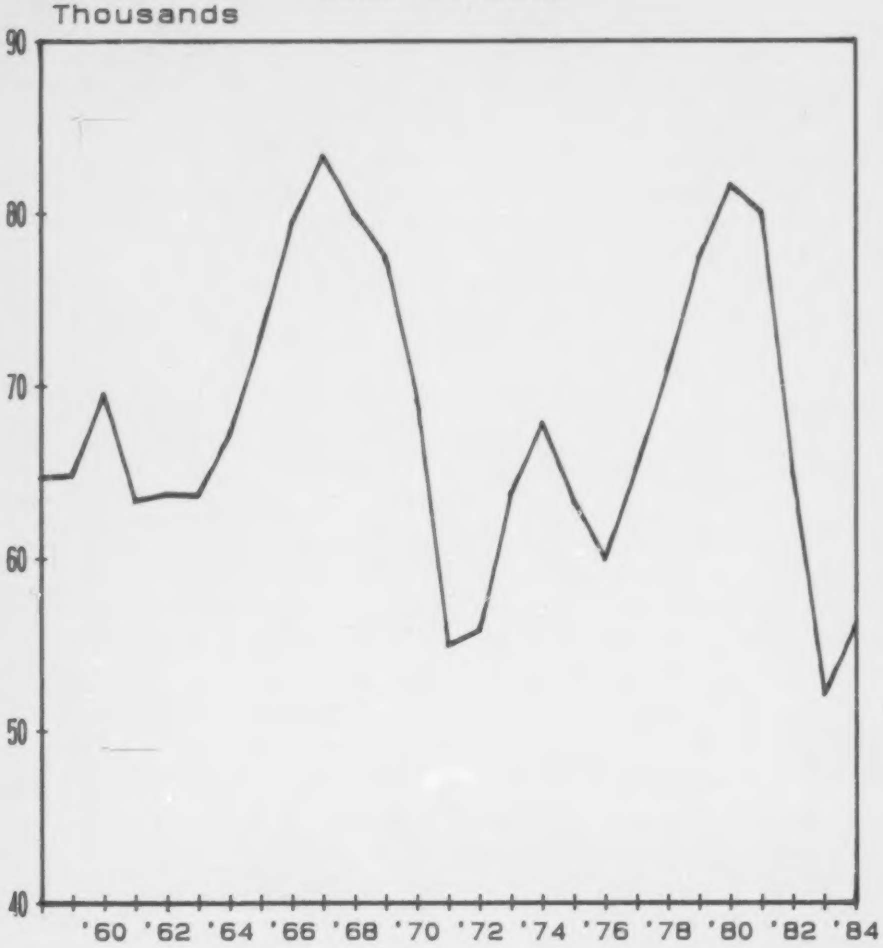
Work injury rates in metal cutting machine tool establishments are substantially lower, in lost workday cases, than the average for all manufacturing industries. The NMTBA Safety Director works closely with government agencies, industry members, and major industry customers to solve problems affecting safety and health.

Total compensation in the metal and metalworking industries in other countries has grown more rapidly than in the U.S. and in some cases is approaching equivalence. When the focus is narrowed to machine tools only, the total compensation of workers in the U.S. machine tool industry is by far the highest among the major machine tool producing nations.

Most of the data in this chapter comes from the U.S. Department of Labor's Bureau of Labor Statistics, primarily from their monthly "Employment and Earnings" tabulation. Some of the data is obtained from the Bureau of the Census, primarily its annual "Survey of Manufactures" series. The Census data may be more complete because it is based on the enumeration of all workers in SIC identified industries that is obtained in the "Census of Manufactures." However, as the Census comes out only every five years and the "Survey of Manufactures" is annual, the data from the BLS offers much more timely information with only a marginal loss of accuracy. For further explanation of the terms used in this chapter, see the Glossary at the end of this book.

Employment in the Metal Cutting Machine Tool Industry

1958 to Date



EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
1958 to Date
(Average Annual Employment in Thousands)

Annual Average Year	All Employees		Production Workers		Female Employees	
	Metal Cutting	Metal Forming	Metal Cutting	Metal Forming	Metal Cutting	Metal Forming
1958	64.7	NA	43.8	NA	6.3	NA
1959	64.8	NA	44.3	NA	6.0	NA
1960	69.5	NA	48.2	NA	6.5	NA
1961	63.3	NA	42.8	NA	5.9	NA
1962	63.7	NA	43.7	NA	5.8	NA
1963	63.6	NA	44.0	NA	5.7	NA
1964	67.1	NA	46.7	NA	5.8	NA
1965	72.8	NA	50.8	NA	6.2	NA
1966	79.4	NA	55.7	NA	7.1	NA
1967	83.3	NA	57.9	NA	7.9	NA
1968	80.0	NA	54.5	NA	7.6	NA
1969	77.4	NA	52.2	NA	7.4	NA
1970	69.2	NA	45.5	NA	6.8	NA
1971	54.9	NA	34.9	NA	5.4	NA
1972	55.8	NA	35.8	NA	5.5	NA
1973	63.7	NA	42.6	NA	6.4	NA
1974	67.8	NA	45.6	NA	7.1	NA
1975	63.3	NA	41.8	NA	6.5	NA
1976	59.9	NA	38.8	NA	6.4	NA
1977	65.2	23.3	41.9	15.4	7.3	NA
1978	70.9	25.0	45.9	16.5	8.4	NA
1979	77.4	26.9	51.2	17.7	9.7	NA
1980	81.6	26.4	54.7	17.0	10.6	NA
1981	80.0	24.4	52.0	15.3	10.7	NA
1982	64.9	21.0	39.3	12.6	8.8	2.2
1983(r)	52.0	17.1	29.9	9.9	7.3	1.7
1984(p)	56.0	18.9	34.1	11.6	8.1	2.0

r - Revised. p - Preliminary. NA - Not Available.

Note: The figures published by the Bureau of Labor Statistics are based on monthly sample surveys and differ from the figures shown by the Census.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84."

EMPLOYMENT AND AVERAGE WEEKLY HOURS OF PRODUCTION WORKERS
Machine Tool Industry
Monthly, 1982 to Date

	Number of Production Workers (Employment in Thousands)			Average Weekly Hours		
Month	1982	1983 (r)	1984	1982	1983 (r)	1984
Metal Cutting						
Jan.	47.8	31.3	31.4	40.7	37.9	41.6
Feb.	47.3	30.8	32.3	40.6	37.3	42.3
Mar.	46.2	29.5	32.8	39.7	38.1	42.0
Apr.	43.3	29.1	33.2	39.3	38.5	42.4
May	41.5	29.1	33.5	38.9	37.9	42.3
June	40.1	29.3	34.1	38.7	38.1	42.3
July	36.8	28.7	34.8	38.8	38.8	42.2
Aug.	36.2	29.0	34.3	37.8	38.2	42.4
Sept.	35.2	29.9	35.3	37.8	39.7	42.6
Oct.	33.0	30.0	35.7	36.7	40.1	42.6
Nov.	32.6	30.9	36.0	37.4	41.1	42.8
Dec.	31.7	31.3	36.2	38.6	42.3	43.6
Yearly Avg.	39.3	29.9	34.1	38.9	39.0	42.4
Metal Forming						
Jan.	15.0	9.8	10.7	37.4	38.7	42.1
Feb.	14.7	9.5	10.9	38.8	37.9	42.8
Mar	14.5	9.6	11.1	38.6	38.6	42.8
Apr.	13.8	9.6	11.2	37.9	38.5	42.0
May	13.3	9.9	11.4	37.3	37.1	41.5
June	12.8	9.7	11.5	37.9	36.7	42.5
July	12.5	9.7	11.4	37.2	37.7	41.7
Aug.	12.1	9.7	11.6	37.1	37.6	41.9
Sept.	11.4	10.1	12.0	36.9	38.4	42.3
Oct.	10.7	10.3	12.1	38.5	39.7	42.6
Nov.	10.5	10.6	12.3	38.4	40.2	42.8
Dec.	10.2	10.6	12.4	39.8	41.2	43.9
Yearly Avg.	12.6	9.9	11.6	38.0	38.6	42.4
Total Machine Tools Yearly Avg.	51.9	39.8	45.7	38.7	38.9	42.4

r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics."

HOURS AND GROSS EARNINGS OF PRODUCTION WORKERS
Metalworking and Metal Cutting Industries, 1938 to Date

	Metalworking Machinery Industry			Metal Cutting Machine Tool Industry		
Year	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
1938	NA	NA	NA	$ 26.75	36.0	$ .74
1939	NA	NA	NA	32.34	42.5	.76
1940	NA	NA	NA	37.44	48.0	.78
1941	NA	NA	NA	44.22	51.6	.86
1942	NA	NA	NA	52.70	53.5	.99
1943	NA	NA	NA	55.11	50.7	1.09
1944	NA	NA	NA	58.19	50.6	1.15
1945	NA	NA	NA	57.14	47.9	1.19
1946	NA	NA	NA	54.40	42.8	1.27
1947	$ 58.69	42.5	$ 1.38	57.87	42.3	1.37
1948	63.13	42.4	1.49	61.68	42.1	1.47
1949	61.33	39.8	1.54	59.23	39.2	1.51
1950	71.73	43.5	1.65	69.87	43.1	1.62
1951	86.01	47.4	1.83	85.14	47.3	1.80
1952	92.20	46.8	1.97	90.24	47.0	1.92
1953	96.81	46.1	2.10	95.17	46.2	2.06
1954	93.09	42.9	2.17	89.25	42.5	2.10
1955	98.34	43.9	2.24	95.48	43.6	2.19
1956	108.96	45.4	2.40	106.25	45.6	2.33
1957	106.89	43.1	2.48	101.04	42.1	2.40
1958	102.00	40.0	2.55	91.20	38.0	2.40
1959	113.74	42.6	2.67	106.93	42.1	2.54
1960	117.27	42.8	2.74	110.99	42.2	2.63
1961	117.04	41.8	2.80	111.92	41.3	2.71
1962	125.57	43.3	2.90	119.41	42.8	2.79
1963	128.90	43.4	2.97	124.42	43.2	2.88
1964	137.06	44.5	3.08	132.01	44.3	2.98
1965	144.37	45.4	3.18	138.76	45.2	3.07
1966	153.72	46.3	3.32	150.20	46.5	3.23
1967	154.56	44.8	3.45	154.25	45.5	3.39
1968	158.70	43.6	3.64	152.65	43.0	3.55
1969	172.38	44.2	3.90	166.61	43.5	3.83
1970	174.28	42.3	4.12	166.00	41.5	4.00
1971	174.62	40.8	4.28	163.90	39.4	4.16
1972	198.29	43.2	4.59	194.71	42.7	4.56
1973	214.90	44.4	4.84	219.11	44.9	4.88
1974	225.33	43.5	5.18	232.74	44.5	5.23
1975	226.46	41.1	5.51	232.68	42.0	5.54
1976	248.89	41.9	5.94	249.96	41.8	5.98
1977	279.72	43.1	6.49	290.18	43.9	6.61
1978	308.88	44.0	7.02	322.56	44.8	7.20
1979	329.30	43.5	7.57	344.21	44.3	7.77
1980	346.83	42.4	8.18	366.21	43.7	8.38
1981	371.90	41.6	8.94	383.95	42.1	9.12
1982	380.09	39.8	9.55	380.44	38.9	9.78
1983(r)	399.67	40.7	9.82	386.49	39.0	9.91
1984	435.86	42.9	10.16	432.48	42.4	10.20

NA - Not Available. r - Revised.

Note: Earnings figures include overtime and premium pay.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84."

AVERAGE WEEKLY EARNINGS OF PRODUCTION WORKERS

Selected Industry Groups, 1938 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1938	$ 23.70	NA	$ 30.59	NA	NA	$ 26.75
1939	26.19	NA	33.58	NA	NA	32.34
1940	28.07	NA	36.69	NA	NA	37.44
1941	33.56	NA	42.68	NA	NA	44.22
1942	42.17	NA	54.15	NA	NA	52.70
1943	48.73	NA	59.13	NA	NA	55.11
1944	51.38	NA	60.12	NA	NA	58.19
1945	48.36	NA	55.28	NA	NA	57.14
1946	46.22	NA	52.28	NA	NA	54.40
1947	51.76	$ 57.58	58.63	$ 54.74	$ 58.69	57.87
1948	56.36	60.38	63.15	60.97	63.13	61.68
1949	57.25	60.31	67.33	63.34	61.33	59.23
1950	62.43	67.08	74.85	68.10	71.73	69.87
1951	68.48	76.13	77.16	77.96	86.01	85.14
1952	72.63	79.55	84.87	81.27	92.20	90.24
1953	76.63	82.68	89.88	83.38	96.81	95.17
1954	76.19	81.40	91.30	84.66	93.09	89.25
1955	82.19	87.36	99.84	89.21	98.34	95.48
1956	85.28	93.06	96.82	95.57	108.96	106.25
1957	88.26	94.12	100.61	96.35	106.89	101.04
1958	89.27	94.33	101.24	101.25	102.00	91.20
1959	96.05	102.92	111.38	106.63	113.74	106.93
1960	97.44	104.55	115.21	110.43	117.27	110.99
1961	100.35	107.42	114.65	114.68	117.04	111.92
1962	104.70	113.01	127.67	119.97	125.57	119.41
1963	108.09	116.20	132.68	122.43	128.90	124.42
1964	112.19	121.69	138.03	125.03	137.06	132.01
1965	117.18	127.58	147.63	131.88	144.37	138.76
1966	122.09	135.34	147.23	143.32	153.72	150.20
1967	123.60	135.89	144.84	146.97	154.56	154.25
1968	132.07	141.88	167.66	152.04	158.70	152.65
1969	139.59	152.15	170.56	161.35	172.38	166.61
1970	143.47	154.95	170.47	168.92	174.28	166.00
1971	153.52	161.99	195.29	175.82	174.62	163.90
1972	167.27	179.34	219.22	193.44	198.29	194.71
1973	179.28	193.83	237.08	207.50	214.90	219.11
1974	190.48	207.62	239.54	218.70	225.33	232.74
1975	205.09	219.22	262.68	246.19	226.46	232.68
1976	225.33	236.74	305.30	263.16	248.89	249.96
1977	248.46	259.79	345.40	289.95	279.72	290.18
1978	270.44	285.44	368.05	318.19	308.88	322.56
1979	290.90	305.98	372.37	351.05	329.30	344.21
1980	310.78	328.00	394.00	389.76	346.83	366.21
1981	343.31	360.33	450.72	425.80	371.90	383.95
1982(r)	355.27	367.62	470.61	461.55	380.09	380.44
1983(r)	382.17	386.78	525.66	486.98	399.67	386.49
1984	403.24	417.32	558.01	520.36	435.86	432.48

NA - Not Available.   r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84."

AVERAGE HOURLY EARNINGS OF PRODUCTION WORKERS
Selected Industry Groups, 1938 to Date, Annual Averages

Year	Durable Goods Industries	Nonelectrical Machinery Industry	Motor Vehicles & Equipment Industry	Aircraft and Parts Industry	Metal Working Machinery Industry	Metal Cutting Machinery Industry
1938	$ .68	NA	$ .91	NA	NA	$ .74
1939	.69	NA	.92	NA	NA	.76
1940	.72	NA	.94	NA	NA	.78
1941	.80	NA	1.04	NA	NA	.86
1942	.94	NA	1.17	NA	NA	.99
1943	1.05	NA	1.24	NA	NA	1.09
1944	1.11	NA	1.27	NA	NA	1.15
1945	1.10	NA	1.27	NA	NA	1.19
1946	1.14	NA	1.35	NA	NA	1.27
1947	1.28	$1.34	1.47	$ 1.37	$ 1.38	1.37
1948	1.40	1.46	1.61	1.49	1.49	1.47
1949	1.45	1.52	1.70	1.56	1.54	1.51
1950	1.52	1.60	1.78	1.64	1.65	1.62
1951	1.65	1.75	1.91	1.78	1.83	1.80
1952	1.75	1.85	2.05	1.89	1.97	1.92
1953	1.86	1.95	2.14	1.99	2.10	2.06
1954	1.90	2.00	2.20	2.07	2.17	2.10
1955	1.99	2.08	2.29	2.16	2.24	2.19
1956	2.08	2.20	2.35	2.27	2.40	2.33
1957	2.19	2.29	2.46	2.35	2.49	2.40
1958	2.26	2.37	2.55	2.50	2.55	2.40
1959	2.36	2.48	2.71	2.62	2.67	2.54
1960	2.43	2.55	2.81	2.70	2.74	2.63
1961	2.49	2.62	2.86	2.77	2.80	2.71
1962	2.56	2.71	2.99	2.87	2.90	2.79
1963	2.63	2.78	3.10	2.95	2.97	2.88
1964	2.71	2.87	3.21	3.02	3.06	2.98
1965	2.79	2.96	3.34	3.14	3.18	3.07
1966	2.90	3.09	3.44	3.31	3.32	3.23
1967	3.00	3.19	3.55	3.45	3.45	3.39
1968	3.19	3.37	3.89	3.62	3.64	3.55
1969	3.38	3.58	4.10	3.86	3.90	3.83
1970	3.56	3.77	4.23	4.12	4.12	4.00
1971	3.80	3.99	4.74	4.32	4.28	4.16
1972	4.05	4.27	5.11	4.65	4.59	4.56
1973	4.32	4.55	5.45	5.00	4.84	4.88
1974	4.68	4.92	5.90	5.40	5.18	5.23
1975	5.14	5.36	6.47	5.99	5.51	5.54
1976	5.55	5.76	7.10	6.45	5.94	5.98
1977	6.06	6.26	7.85	6.92	6.49	6.61
1978	6.58	6.78	8.50	7.54	7.02	7.20
1979	7.13	7.32	9.06	8.26	7.57	7.77
1980	7.75	8.00	9.85	9.28	8.18	8.38
1981	8.54	8.81	11.02	10.31	8.94	9.12
1982(r)	9.04	9.26	11.62	11.23	9.55	9.78
1983(r)	9.39	9.55	12.14	11.82	9.82	9.91
1984	9.74	9.96	12.74	12.36	10.16	10.20

NA - Not Available. r - Revised.

Source: U.S. Bureau of Labor Statistics, "Employment and Earnings Statistics, 1909-84."

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1978, 1981, 1983

Region and Survey Year	Occupation				
	Machine Tool Operators, Production				
	Class A (b)	Class B (c)	Class C (d)	Numerically Controlled	Tool Room One Type Machine
1. Baltimore, Md.					
Jan. 1978	$ 6.74	$ 5.79	$ 5.24	$ 5.67	$ 6.54(e)
Jan. 1981	9.01	7.84	7.01	8.45	NA
Nov. 1983	10.65	9.61	7.83	10.25	NA
2. Boston, Mass.					
Jan. 1978	6.54	6.01	4.71	6.24	6.72
Jan. 1981	8.59	8.35	5.87	8.71	NA
Nov. 1983	10.99	10.16	NA	9.99	NA
3. Buffalo, N.Y.					
Jan. 1978	6.77	6.28	5.44	7.00	6.80
Jan. 1981	8.97	8.25	7.01	9.47	7.77
Nov. 1983	10.06	8.15	7.29	11.24	10.92
4. Chicago, Ill.					
Jan. 1978	7.38	6.51	5.90	7.55	8.36
Jan. 1981	9.60	8.00	6.63	9.68	11.12
Nov. 1983	11.50	9.28	8.39	11.03	12.63
5. Cleveland, Ohio					
Jan. 1978	7.02	6.01	4.12	7.17	7.09
Jan. 1981	9.43	8.13	6.78	9.41	9.68
Nov. 1983	10.15	8.92	7.10	10.40	10.67
6. Denver, Colo.					
Jan. 1978	6.60	5.36	5.04	6.44	6.63
Jan. 1981	9.30	7.23	NA	8.61	10.68
Nov. 1983	10.41	7.92	5.83	10.26	11.32
7. Detroit, Mich.					
Jan. 1978	8.19	7.01	5.48	7.14	8.94
Jan. 1981	11.61	9.48	6.21	9.98	11.98
Nov. 1983	12.70	10.92	9.58	11.61	12.39
8. Houston, Tx.					
Jan. 1978	7.15	6.66	4.89	7.29	7.26
Jan. 1981	9.92	8.96	5.93	10.25	10.47
Nov. 1983	11.56	9.71	9.68	11.86	11.55
9. L.A.-Long Beach, Cal.					
Jan. 1978	6.87	5.45	3.96	6.86	7.44
Jan. 1981	9.38	7.39	4.83	9.79	9.70
Nov. 1983	12.71	8.38	NA	14.72	12.46
10. Milwaukee, Wis.					
Jan. 1978	7.78	6.89	NA	7.43	7.86
Jan. 1981	10.47	9.91	8.45	10.36	10.63
Nov. 1983	11.71	11.37	10.22	12.06	11.89
11. Newark, N.J.					
Jan. 1978	6.50	6.59	4.85	6.29	7.47
Jan. 1981	9.44	9.04	6.35	7.68	9.25
Nov. 1983	9.83	9.38	5.31	10.54	10.45
12. Pittsburgh, Pa.					
Jan. 1978	7.15	6.71	6.15	6.69	7.21(e)
Jan. 1981	9.44	8.80	8.14	9.38	NA
Nov. 1983	10.53	8.89	7.48	11.46	10.13
13. St. Louis, Mo.-Ill.					
Jan. 1978	8.25	6.14	6.12	7.26	8.03
Jan. 1981	9.45	8.36	8.30	9.27	8.69
Nov. 1983	11.63	9.20	7.27	11.36	12.00

NA - Not Available.

(a) Nonelectrical Machinery (SIC 35).

(b) Operators who set up their own machines and perform a variety of machine operations to close tolerances using decisions based on blueprints and layouts.

(c) Operators who set up their own machines and maintain operation set-ups made by others.

(d) Operators who perform routine and repetitive operations but do not set up machines.

(e) More than one type of machine.

AVERAGE HOURLY EARNINGS IN THE MACHINERY MANUFACTURING INDUSTRY (a)

In Selected Areas by Occupation, 1978, 1981, 1983

(Continued)

	Occupation					
	Assemblers		Inspectors		Laborers, Material Handling	Tool Clerks
	Class A (f)	Class B (g)	Class A (h)	Class B (i)		
1.						
	$ 6.03	$ 5.71	$ 6.72	NA	$ 5.13	$ 5.38
	8.00	6.88	8.66	$ 7.72	7.21	NA
	11.00	7.10	11.45	8.04	5.96	NA
2.						
	6.18	4.89	NA	5.26	4.56	5.73
	8.31	6.62	8.47	7.44	6.18	7.22
	9.14	7.24	10.01	8.53	6.54	9.26
3.						
	5.92	6.43	7.20	6.36	NA	5.86
	9.24	8.07	9.35	7.62	8.11	7.80
	10.36	10.27	10.95	9.54	8.66	8.36
4.						
	6.84	6.49	7.43	6.80	5.86	6.47
	8.95	7.43	9.25	8.56	6.81	9.10
	11.01	8.93	11.54	10.11	8.35	10.15
5.						
	7.21	6.13	7.20	6.65	6.07	6.50
	9.64	7.80	9.93	8.46	8.90	8.86
	11.02	7.43	10.99	9.09	8.90	10.13
6.						
	5.94	4.30	6.67	5.93	4.75	5.89
	7.79	5.40	8.55	7.04	5.89	7.54
	9.53	7.05	9.82	NA	NA	NA
7.						
	7.80	7.23	7.79	6.50	6.94	7.13
	11.17	9.59	11.01	NA	9.45	9.80
	12.47	11.23	12.33	10.75	10.50	11.59
8.						
	6.89	5.86	7.37	6.43	5.38	6.36
	9.75	9.06	10.07	8.45	7.41	7.80
	10.89	10.77	11.57	11.22	9.15	9.20
9.						
	6.29	4.41	6.74	5.50	4.67	5.24
	8.02	6.09	9.77	7.24	5.74	6.93
	10.15	7.29	11.90	7.10	8.45	9.15
10.						
	7.72	6.96	7.24	6.97	6.19	6.28
	10.31	10.05	10.45	9.91	9.24	10.12
	11.45	10.76	11.82	10.92	10.51	10.95
11.						
	6.54	5.71	5.95	6.61	4.96	5.74
	7.93	5.90	7.83	7.77	7.21	7.82
	9.47	8.04	9.60	8.27	6.36	9.09
12.						
	7.14	6.02	7.37	6.66	5.33	6.18
	8.52	7.78	9.44	8.79	8.74	7.48
	9.74	7.63	11.22	10.50	9.68	10.08
13.						
	6.91	5.81	7.24	6.23	5.11	5.81
	9.10	7.57	9.04	8.35	6.79	7.86
	11.49	8.73	10.58	9.44	8.05	9.22

NA - Not Available.

(f) Fits and adjusts parts and makes decisions regarding proper performance of component or unit.

(g) Assembles parts in accordance with standard and prescribed procedures. Requires some fitting and adjusting.

(h) Responsible for decisions regarding quality of product and operations. Troubleshooting and interpreting of drawings and specifications is involved.

(i) Tests products and processes having rigid specifications with established inspection procedures.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

EMPLOYMENT IN THE MACHINE TOOL INDUSTRY
Selected Years, 1937 to Date

	Machine Tool Total		Metal Cutting		Metal Forming	
Year	All Employees	Production Workers	All Employees	Production Workers	All Employees	Production Workers
1937	NA	NA	NA	37,477	NA	NA
1939	NA	NA	NA	36,997	NA	NA
1947	NA	NA	70,001	54,435	NA	NA
1949	NA	NA	52,384	38,584	NA	NA
1950	NA	NA	54,747	41,555	NA	NA
1951	NA	NA	83,855	64,029	NA	NA
1952	NA	NA	102,735	79,471	NA	NA
1953	NA	NA	99,494	76,840	NA	NA
1954	NA	NA	80,959	62,106	NA	NA
1955	NA	NA	77,063	58,600	NA	NA
1956	NA	NA	85,469	65,208	NA	NA
1957	NA	NA	79,895	59,600	NA	NA
1958	75,366	51,726	52,864	36,154	22,502	15,572
1959	75,091	53,332	52,797	35,436	22,294	17,896
1960	81,200	57,439	58,777	39,487	22,423	17,952
1961	78,108	54,633	54,901	36,373	23,207	18,260
1962	82,251	57,662	58,855	39,253	23,396	18,409
1963	83,136	56,790	61,058	41,008	22,078	15,782
1964	88,079	61,196	65,078	44,471	23,001	16,725
1965	96,334	67,257	70,827	48,745	25,517	18,512
1966	108,174	76,190	79,767	55,279	28,407	20,911
1967	116,400	81,400	87,200	60,500	29,200	20,900
1968	112,200	76,900	84,300	57,500	27,900	19,400
1969	110,600	74,700	82,600	55,300	28,000	19,400
1970	100,200	65,900	71,300	45,800	28,900	20,100
1971	78,400	49,200	54,000	33,200	24,400	16,000
1972	76,600	50,000	52,500	33,400	24,100	16,600
1973	86,900	58,700	59,900	39,800	27,000	18,900
1974	94,000	64,200	65,000	43,900	29,000	20,300
1975	88,800	58,500	62,800	40,800	26,000	17,700
1976	81,000	53,500	58,100	37,600	22,900	15,900
1977(r)	83,100	53,300	59,400	37,200	23,700	16,100
1978	89,500	59,200	64,300	42,200	25,200	17,000
1979	96,100	64,400	69,100	45,700	27,000	18,700
1980	99,700	66,000	72,800	47,800	26,900	18,200
1981	98,300	63,900	74,300	47,900	24,000	16,000
1982(r)	77,600	45,800	58,100	33,700	19,500	12,100
1983E	62,176	36,697	46,552	27,002	15,624	9,695

NA - Not Available. E - Estimate by NMTBA. r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	81,200	$ 523.0	57,439	116.7	$ 324.7
1962	82,251	573.8	57,662	118.2	344.5
1964	88,079	678.0	61,196	135.2	428.4
1966	108,174	918.3	76,190	171.2	591.7
1968	112,200	1,001.0	76,900	163.1	619.7
1970	100,200	965.3	65,900	136.6	572.6
1971	78,400	774.6	49,200	97.4	428.7
1972	76,600	839.2	50,000	103.3	489.7
1973	86,900	1,033.0	58,700	125.1	623.0
1974	94,000	1,245.2	64,200	135.8	748.0
1975	88,800	1,193.4	58,500	117.5	695.2
1976	81,000	1,182.2	53,500	105.5	688.1
1977(r)	83,100	1,309.7	53,300	109.1	760.1
1978	89,500	1,536.3	59,200	123.3	932.8
1979	96,100	1,789.7	64,400	133.4	1,092.0
1980	99,700	2,018.1	66,000	134.0	1,202.7
1981	98,300	2,129.8	63,900	129.3	1,259.0
1982(r)	77,600	1,769.8	45,800	86.6	952.5

r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Metal Forming Machine Tool Industry
Selected Years

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1960	22,423	$152.1	17,952	35.8	$100.9
1962	23,396	172.0	18,409	37.0	109.5
1964	23,001	180.3	16,725	37.9	121.6
1966	28,407	244.9	20,911	47.4	164.2
1968	27,900	245.8	19,400	42.9	157.4
1970	28,900	280.6	20,100	43.4	177.3
1971	24,400	241.5	16,000	32.9	142.5
1972	24,100	265.4	16,600	34.7	163.8
1973	27,000	323.6	18,900	41.8	205.1
1974	29,000	370.8	20,300	43.3	238.2
1975	26,000	343.1	17,700	35.8	208.2
1976	22,900	336.8	15,900	32.0	214.2
1977	23,700	360.7	16,100	32.8	219.4
1978	25,200	415.6	17,000	35.1	253.2
1979	27,000	465.6	18,700	37.5	305.1
1980	26,900	514.1	18,200	35.2	313.2
1981	24,000	496.8	16,000	30.8	294.9
1982(r)	19,500	438.1	12,100	23.2	245.3

r - Revised.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

EMPLOYMENT AND COMPENSATION
Metal Cutting Machine Tool Industry
Selected Years, 1937 to Date

	All Employees		Production Workers		
Year	Number	Payroll (Million $)	Number	Man-hours (Million)	Wages (Million $)
1937	NA	NA	37,477	NA	$ 62.6
1939	NA	NA	36,997	NA	62.9
1947	70,001	$ 234.0	54,435	113.4	165.0
1949	52,384	190.4	38,584	74.5	120.0
1950	54,747	226.8	41,555	88.6	150.6
1951	83,855	396.4	64,029	155.7	281.0
1952	102,735	524.5	79,471	194.6	385.3
1953	99,494	537.6	76,840	175.3	392.6
1954	80,959	432.3	62,106	133.2	302.7
1955	77,063	426.6	58,600	128.1	297.2
1956	85,469	511.9	65,200	147.5	360.6
1957	79,895	470.9	59,600	125.4	319.3
1958	52,864	300.3	35,154	69.6	182.2
1959	52,797	329.5	36,436	72.2	202.0
1960	58,777	370.9	39,487	80.9	223.8
1961	54,901	353.0	36,373	72.7	201.5
1962	58,855	401.8	39,253	81.2	235.0
1963	61,058	438.2	41,008	86.5	272.2
1964	65,078	497.7	44,471	97.3	306.8
1965	70,827	565.0	48,745	108.1	353.7
1966	79,767	673.4	55,279	123.8	427.5
1967	87,200	759.9	60,500	131.8	476.5
1968	84,300	755.2	57,500	120.2	462.3
1969	82,600	791.6	55,300	116.0	477.5
1970	71,300	684.7	45,800	93.2	395.3
1971	54,000	533.1	33,200	64.5	286.2
1972	52,500	573.8	33,400	68.2	325.9
1973	59,900	709.4	39,800	83.3	417.9
1974	65,000	874.4	43,900	92.5	509.8
1975	62,800	850.3	40,800	81.7	486.8
1976	58,100	845.4	37,600	73.5	473.9
1977(r)	59,400	949.0	37,200	76.3	540.7
1978	64,300	1,120.7	42,200	88.2	679.6
1979	69,100	1,304.1	45,700	95.9	786.9
1980	72,800	1,504.0	47,800	98.8	889.5
1981	74,300	1,633.0	47,900	98.5	964.1
1982(r)	58,100	1,331.7	33,700	63.4	707.2

r - Revised. NA - Not Available.

Sources: U.S. Bureau of the Census, "Census of Manufactures" and "Annual Survey of Manufactures."

SELECTED LABOR RATIOS
1961 to Date (r)

	Payroll per Employee	Prod. Wkrs. % of Total Employment	Annual Man-Hours of Prod. Workers	Average Hourly Earnings, Prod. Workers	Value Added Per Employee	Payroll as % of Value Added	Value Added per Man Hour of Prod. Wkrs.
METAL CUTTING MACHINE TOOL INDUSTRY							
1961	$ 6,429	66%	1,999	$ 2.77	$10,020	64%	$ 7.57
1962	6,827	67	2,069	2.89	11,401	60	8.26
1963	7,171	67	2,109	3.14	11,445	62	8.08
1964	7,645	68	2,186	3.15	12,844	59	8.59
1965	7,980	68	2,219	3.27	14,033	56	9.19
1966	8,436	69	2,238	3.45	15,466	54	9.96
1967	8,714	69	2,179	3.62	15,955	55	10.56
1968	8,958	68	2,090	3.85	16,336	55	11.46
1969	9,584	67	2,098	4.12	17,452	55	12.43
1970	9,603	64	2,035	4.24	15,597	62	11.93
1971	9,872	61	1,943	4.44	15,181	65	12.71
1972	10,930	64	2,042	4.78	17,175	64	13.22
1973	11,843	66	2,093	5.02	20,269	58	14.58
1974	13,452	68	2,107	5.51	24,877	54	17.48
1975	13,540	65	2,002	5.96	26,119	52	20.07
1976	14,551	64	1,955	6.45	28,642	51	22.64
1977	15,976	63	2,051	7.09	31,416	51	24.46
1978	17,429	66	2,090	7.71	35,257	49	25.70
1979	18,873	66	2,098	8.21	41,010	46	29.55
1980	20,659	66	2,067	9.00	46,005	45	33.90
1981	21,978	64	2,056	9.79	50,335	44	37.97
1982(p)	22,921	58	1,881	11.15	43,967	52	40.29
METAL FORMING MACHINE TOOL INDUSTRY							
1961	$ 6,818	79%	1,905	$ 2.91	$ 9,552	71%	$ 6.37
1962	7,351	79	2,012	2.96	11,363	65	7.18
1963	7,316	71	2,189	3.10	12,728	57	8.13
1964	7,839	72	2,269	3.20	13,847	56	8.40
1965	8,058	72	2,243	3.34	13,686	58	8.40
1966	8,623	73	2,267	3.46	15,214	56	9.11
1967	8,548	72	2,211	3.57	14,973	57	9.46
1968	8,810	70	2,211	3.67	16,247	54	10.57
1969	9,664	69	2,186	4.06	16,182	60	10.68
1970	9,709	70	2,159	4.09	16,249	60	10.82
1971	9,898	66	2,056	4.33	14,914	66	11.06
1972	11,012	69	2,090	4.72	17,332	64	12.04
1973	11,985	70	2,212	4.91	20,241	59	13.07
1974	12,786	70	2,133	5.50	21,852	59	14.64
1975	13,196	68	2,023	5.82	23,781	55	17.27
1976	14,707	69	2,013	6.69	27,122	54	19.41
1977	15,219	68	2,037	6.69	30,460	50	22.01
1978	16,492	67	2,065	7.21	33,385	49	23.97
1979	17,985	69	2,005	8.14	37,185	48	26.77
1980	19,112	68	1,934	8.90	38,740	49	29.61
1981	20,700	67	1,925	9.57	40,688	51	31.70
1982(p)	22,467	62	1,917	10.57	39,887	56	33.53

p - Preliminary. r - Revised.

Source: 1963, 1967, 1972, 1977, 1982: U.S. Bureau of the Census, "Census of Manufactures," 1982, Industry Series: "Metalworking Machinery and Equipment," MC 82-1-35C and earlier years. Other Years: U.S. Bureau of the Census, "Annual Survey of Manufactures" (annually).

WEEKLY OVERTIME HOURS OF PRODUCTION WORKERS
Selected Industry Groups, 1959 to Date, Annual Averages

Year	Manufacturing	Durable Goods Industry	Nonelectrical Machinery Machinery Industry	Metalworking Machinery Industry
1959	2.7	2.7	2.9	4.0
1960	2.4	2.4	2.7	4.3
1961	2.4	2.3	2.5	3.4
1962	2.8	2.8	3.1	4.7
1963	2.8	2.9	3.2	4.8
1964	3.1	3.3	3.9	5.9
1965	3.6	3.9	4.6	6.7
1966	3.9	4.3	5.5	7.8
1967	3.4	3.5	4.4	6.5
1968	3.6	3.8	4.0	5.4
1969	3.6	3.8	4.5	6.0
1970	3.0	2.9	3.2	4.3
1971	2.9	2.9	2.6	2.8
1972	3.5	3.6	3.8	4.9
1973	3.8	4.1	4.7	6.4
1974	3.2	3.4	4.3	5.8
1975	2.6	2.5	3.0	3.3
1976	3.1	3.1	3.1	4.0
1977	3.5	3.7	4.0	5.5
1978	3.6	3.8	4.3	5.9
1979	3.3	3.5	4.0	5.7
1980	2.8	2.8	3.4	4.8
1981	2.8	2.8	3.2	4.1
1982	2.3	2.2	2.2	2.7
1983	3.0	3.0	2.7	3.3
1984	3.4	3.6	3.7	4.9

Sources: U.S. Bureau of Labor Statistics, "Employment and Earnings", monthly and annual supplements.

WORK INJURY RATES
By Industry, 1982 (a)

	Incidence Rates (per 100 Employees)			Average Lost Workdays Per Lost Workday Case
Industry	Total Recordable Cases	Lost Workday Cases	Nonfatal Cases Without Lost Workdays	
Manufacturing	9.9	4.3	5.6	17.0
Fabricated Metal Products	14.9	6.2	8.7	16.0
Metal Stampings	14.6	5.7	8.9	16.0
Machinery Except Electrical	10.5	4.1	6.4	16.0
Engines and Turbines	7.8	3.5	4.3	18.0
Construction and Related Machinery	14.3	5.9	8.4	16.0
Metalworking Machinery	11.0	3.6	7.4	16.0
Machine Tools, Metal Cutting Types	11.3	4.1	7.2	16.0
Machine Tools, Metal Forming Types	12.8	4.9	7.9	17.0
Special Industry Machinery	12.6	4.7	7.9	15.0
General Industrial Machinery	12.0	4.8	7.2	16.0
Transportation Equipment	8.8	3.9	4.8	18.0
Motor Vehicles and Equipment	8.2	3.4	4.8	16.0

(a) The publication of this data was discontinued in 1982.

Note: Data represents work-related injuries and illnesses in comparable industries.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

AVERAGE HOURLY EARNINGS AND SUPPLEMENTARY LABOR COST
in the Machine Tool Industry of the United States and Seven Foreign Countries

Country	Date	Industry	Workers Covered	Average Hourly Earnings	Estimated Supplementary Labor Cost	Total Compensation
Sweden	1983	(3)	P.W.	$5.34	$3.47	$ 8.81
France	1982	(3)	P.W.	4.79	3.64	8.43
Germany (Federal Republic)	1982	(3)	P.W.	6.33	4.61	10.94
Italy	1982	(3)	P.W.	4.03	3.56	7.59
Switzerland	1982	(2)	P.W.	8.05	3.21	11.26
United Kingdom	1982	(3)	P.W.	5.07	1.86	6.93
Japan	1984	(1)	P.W.	6.18	1.04	7.22
United States	1982	(1)	P.W.	9.55	3.27	12.82

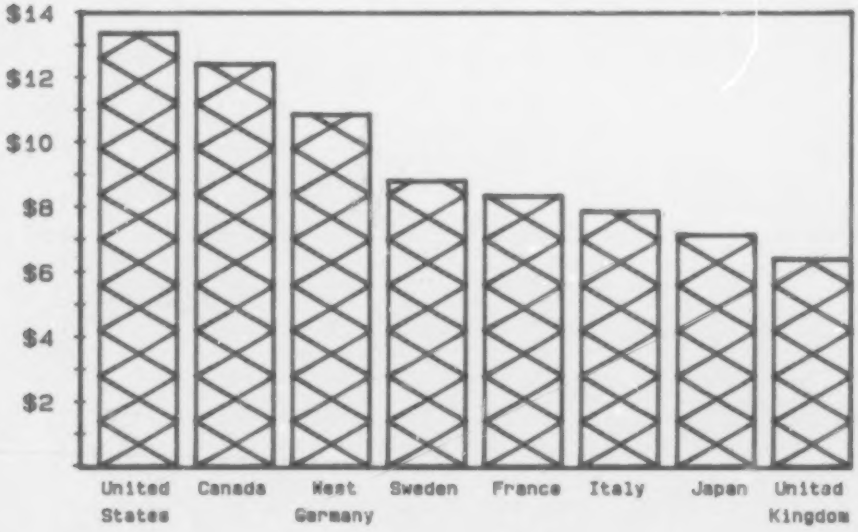
P.W. - Production Workers.

(1) Machine Tools.
(2) Metals and Machines.
(3) Non-Electrical Machinery.

Source: U.S. Bureau of Labor Statistics, Branch of International Comparisons.

This table differs from the one shown in chapter 2 because it focuses directly on machine tool industry compensation. The other table shows production worker compensation in manufacturing as a whole.

Average Hourly Compensation
of Prduction Workers
Machinery, Except Electrical, 1983



AVERAGE HOURLY EARNINGS IN METAL AND METALWORKING INDUSTRIES
In Selected Countries, for Selected Years

Country	Industry	1975	1980	1981	1982 (r)	1983	Percent Increase 1975-83
Canada	(1)	$5.54	$7.55	$8.25	$8.75	$9.13(b)	64.8%
France	(1)	2.97	5.72	5.15	4.88	4.68	57.6
Italy	(1)	3.22	5.51	5.13	4.99	NA	NA
Japan (r)	(1)	3.90	7.36	8.09	7.59	8.03	105.9
Switzerland	(2)	4.88	8.89	8.11	8.38	8.40	72.1
United Kingdom (a)	(1)	3.07	6.13	5.84	5.50	5.10	66.1
United States	(1)	5.37	8.00	8.81	9.26	9.55	77.8
West Germany	(1)	4.22	7.69	6.48	6.32	6.21	47.2

r - Revised. NA - Not Available.

(a) Men only.
(b) Ten month average.
(1) Machinery, except electrical.
(2) Metal products, machinery, etc.

Sources: "ILO 1983 Statistical Yearbook" ("Statistics of average earnings . . . usually cover cash payments received from employers, i.e., renumeration for normal working hours, payments for overtime and time not worked (holidays, vacation, etc.), production bonuses, cost-of-living allowances and special premiums . . .").

AVERAGE HOURLY COMPENSATION OF PRODUCTION WORKERS
In Selected Industry Groups, 1983 (a)

Country	All Manufacturing	Machinery, Except Electrical	Electrical Equipment	Motor Vehicles
United States	$12.26	$13.36E	$11.96E	$19.04
Canada	11.44	12.41E	10.22E	13.73
France	7.77	8.33E	7.69E	8.96
West Germany	10.37	10.86E	9.82E	13.26
Italy	7.62	7.86E	7.51E	8.02
Japan	6.12	7.14	5.54	7.83(b)
Sweden	8.89	8.81	8.58	9.21
United Kingdom	6.28	6.40E	5.98E	6.95

E - Estimated by NMTBA.

(a) Preliminary estimates.
(b) Includes motorcycle manufacturing.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

8

FINANCE

Publicly available data on the financial status of the machine tool industry is scarce. A few sources are the annual reports of the publicly owned machine tool companies and of other companies that produce machine tools. Government statistics on the capital expenditures for "structures and additions" and for "machinery and equipment" in the metal cutting and metal forming machine tool industries are an indirect measure of financial health.

Selected financial indicators for a machine tool composite from the "Industry Surveys" of Standard and Poor's Corporation are included in this chapter. The machine tool composite figures are based on a weighted average of individual company data. Prior to 1980, six companies formed the basis of the composite. Since 1980, only five firms have been included. However, since the figures presented are weighted according to the total market value of equity stock outstanding in these firms, comparisons between data before and after 1980 should prove valid.

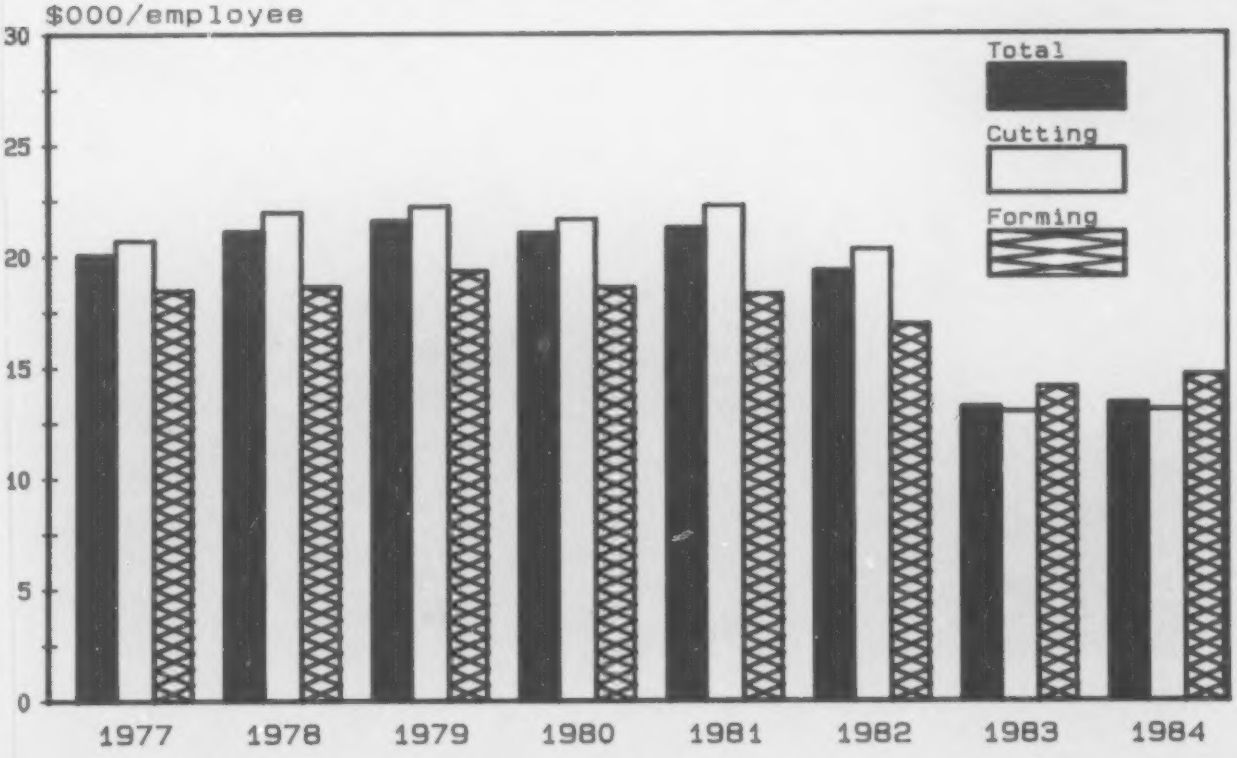
Each indicator from "Industry Surveys" is an index based on average value per share of outstanding stock. We have converted these indicators from the original base of 1941–1943 = 10 to 1967 = 100 to conform with other indexes in this publication. The financial indicators for the composite do not necessarily represent an average for the entire machine tool industry, but given the scarcity of financial information, are a valuable addition to this chapter.

Data collected by an outside research group for the National Machine Tool Builders' Association indicate that the rate of profit of machine tool manufacturers tends to be somewhat higher than that of all manufacturing industries during good times, but drastically worse in less prosperous periods.

It should be emphasized that all the data in this section are in current dollars and that in periods of rapid inflation the true state of earnings and capital accumulation is seriously distorted. In particular, an inflationary environment leads to the overstatement of "inventory profits" and the understatement—relative to replacement costs—of depreciation charges on capital equipment.

Machine Tool Industry Productivity

(Constant Dollar Shipments per Production Worker)



SELECTED FINANCIAL RATIOS FOR CORPORATIONS IN SELECTED INDUSTRIES, 1984

Industry	% Net Operating Profit on Sales	% Earnings After Taxes on Sales	% Earnings After Taxes On Net Worth	% Depreciation and Amortization on Net Sales	Times Inventory Turnover	Current Assets to Current Liabilities
Machine Tools	(2.6%)	(2.1%)	(3.6%)	3.7%	3.2	2.6
All Manufacturing Corporations	6.8	4.6	12.5	3.7	7.0	1.6
Durable Manufactures	6.6	4.4	12.3	3.6	5.6	1.7
Electrical Machinery	6.8	4.4	11.7	3.3	5.0	1.6
Machinery, Except Electrical	7.5	5.7	11.7	4.2	4.9	2.0
Motor Vehicles	6.7	6.4	25.3	3.9	12.2	1.4
Chemical and Allied Products	7.9	6.5	13.9	4.3	7.1	1.6

( ) - Negative Number.

Source: U.S. Department of Commerce, Bureau of Census, "Quarterly Financial Report for Manufacturing Corporations" and NMTBA.

GROSS BOOK VALUE OF DEPRECIABLE ASSETS (a)

Machine Tool Industry, 1963 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structures and Additions	Machinery and Equipment	Total	Structures and Additions	Machinery and Equipment
1963	$ 743	$ 531	NA	NA	$212	NA	NA
1964	800	558	NA	NA	242	NA	NA
1965	NA	NA	NA	NA	NA	NA	NA
1966	NA	NA	NA	NA	NA	NA	NA
1967	1,099	800	$245	$ 555	299	$ 88	$211
1968	1,161	845	253	592	316	94	222
1969	1,224	889	269	620	335	98	237
1970	1,235	884	270	614	351	109	242
1971	1,241	874	272	602	367	114	253
1972	1,228	841	263	578	387	120	267
1973	1,251	851	259	592	400	121	279
1974	1,324	895	260	635	429	131	298
1975	1,356	937	266	671	419	125	294
1976	1,412	1,000	279	721	412	127	285
1977(r)	1,498	1,044	310	734	454	133	321
1978(r)	1,698	1,180	340	840	518	145	373
1979(r)	1,892	1,336	383	953	556	155	401
1980(r)	2,052	1,469	416	1,053	583	164	420
1981(r)	2,324	1,599	449	1,150	725	205	520
1982(r)	2,424	1,682	473	1,209	742	202	540

r - Revised. NA - Not Available.

(a) Includes all fixed depreciable assets on the books of establishments at year end. Values represent actual cost of assets at the time they were acquired. Total includes all buildings, structures, machinery and equipment. Machinery and equipment includes production, office and transportation equipment.

Source: U.S. Bureau of the Census, "Census of Manufactures," 1963, 1967, 1972, 1977, 1982; U.S. Bureau of the Census, "Annual Survey of Manufactures."

NEW CAPITAL EXPENDITURES IN THE MACHINE TOOL INDUSTRY

1954 to Date

(Millions of Dollars)

		Metal Cutting Industry			Metal Forming Industry		
Year	Total	Total	Structures and Additions	Machinery and Equipment	Total	Structures and Additions	Machinery and Equipment
1954	NA	$ 37.7	$ 11.2	$ 26.5	NA	NA	NA
1955	NA	44.0	NA	NA	NA	NA	NA
1956	NA	49.2	NA	NA	NA	NA	NA
1957	NA	39.7	NA	NA	NA	NA	NA
1958	$ 30.5	18.8	1.9	16.9	$11.7	$ 3.8	$ 7.9
1959	31.9	22.2	NA	NA	9.7	NA	NA
1960	37.4	24.8	NA	NA	12.6	NA	NA
1961	26.4	18.7	NA	NA	7.7	NA	NA
1962	39.3	26.6	NA	NA	12.7(a)	NA	NA
1963	39.6	28.8	5.4	23.4	10.8	2.1	8.7
1964	71.7	41.7	11.0	30.7	30.0(a)	7.5(a)	22.5(a)
1965	74.2	53.7	10.2	43.5	20.5	4.4(a)	16.1
1966	102.5	74.9	17.1	57.8	27.6	6.2(a)	21.4(a)
1967	104.9	78.7	19.3	59.3	26.2	5.7	20.5
1968	90.9	62.3	9.1	53.2	28.6	7.7	20.9
1969	105.0	75.5	21.8	53.7	29.5	7.7	21.8
1970	72.7	49.3	11.7	37.6	23.4	7.8	15.6
1971	39.1	28.7	4.6	24.1	10.4	1.6	8.9
1972	52.7	35.2	7.2	28.0	17.5	4.7	12.8
1973	65.9	38.4	7.3	31.1	27.5	4.0	23.4
1974	93.3	58.9	10.6	48.3	34.4	8.6	25.9
1975	76.1	52.2	7.9	44.2	23.9	4.0	19.9
1976	93.5	65.2	11.2	54.0	28.3	10.8	17.5
1977	132.4	107.9	19.1	88.8	24.5	2.6	21.9
1978	142.4	102.0	22.4	79.6	40.4	5.8	34.6
1979	199.4	147.6	31.8	115.8	51.8	9.7	42.1
1980	241.0	171.6	39.8	131.8	69.4	14.5	54.9
1981	296.2	233.2	52.3	180.9	63.0	12.8	50.2
1982(r)	200.5	157.1	36.6	120.6	43.4	5.5	37.8

NA - Not Available. r - Revised.

(a) Standard errors exceeding 15%, not consistent with other Census data in metal forming.

Note: Change of definition of machine tool industry makes comparisons before 1957 difficult.

Source: U.S. Bureau of the Census, "Census of Manufactures", 1963, 1967, 1972, 1977, 1982; U.S. Bureau of the Census, "Annual Survey of Manufactures."

MACHINE TOOL FINANCIAL INDICATORS (a)
Per Share Data, 1956 to Date
(1967 = 100)

Year	Sales	Operating Profit	Depreciation	Book Value	Working Capital	Capital Expenditures
1956	73.4	66.0	45.8	75.3	67.1	90.7
1957	67.9	53.3	50.9	78.8	71.0	67.2
1958	42.6	14.9	52.4	77.4	70.3	51.4
1959	46.3	15.7	53.8	75.5	68.0	42.5
1960	54.8	26.5	56.6	75.6	65.8	61.1
1961	54.1	29.3	56.1	76.4	67.6	45.3
1962	59.6	28.4	50.9	77.8	70.1	44.9
1963	61.7	37.2	58.0	80.0	72.2	61.9
1964	64.9	57.1	66.0	74.5	66.1	95.1
1965	77.2	70.1	73.6	81.6	82.2	103.2
1966	92.9	88.7	84.4	90.2	92.1	142.5
1967	100.0	100.0	100.0	100.0	100.0	100.0
1968	99.0	100.3	117.5	106.9	101.7	167.6
1969	100.7	87.6	118.9	110.2	103.6	156.7
1970	89.7	42.4	120.8	110.1	107.7	122.3
1971	73.4	16.2	112.7	108.0	101.9	93.9
1972	88.4	32.2	111.8	106.2	104.7	150.6
1973	119.4	73.1	116.0	111.8	107.4	217.8
1974	145.0	81.4	124.5	116.5	153.2	247.8
1975	156.6	82.7	136.8	120.5	159.6	176.5
1976	146.9	79.0	142.5	124.8	154.1	156.3
1977	167.2	114.5	151.9	132.5	158.1	208.9
1978	197.7	165.5	157.1	149.2	169.9	248.2
1979	237.5	234.4	177.8	177.8	190.0	371.7
1980	309.2	277.9	218.4	226.8	263.4	542.6
1981	331.1	284.3	259.0	254.7	272.0	489.4
1982	320.2	207.3	334.4	NA	287.4	541.0
1983	200.6	5.4	361.8	272.3	256.4	321.7

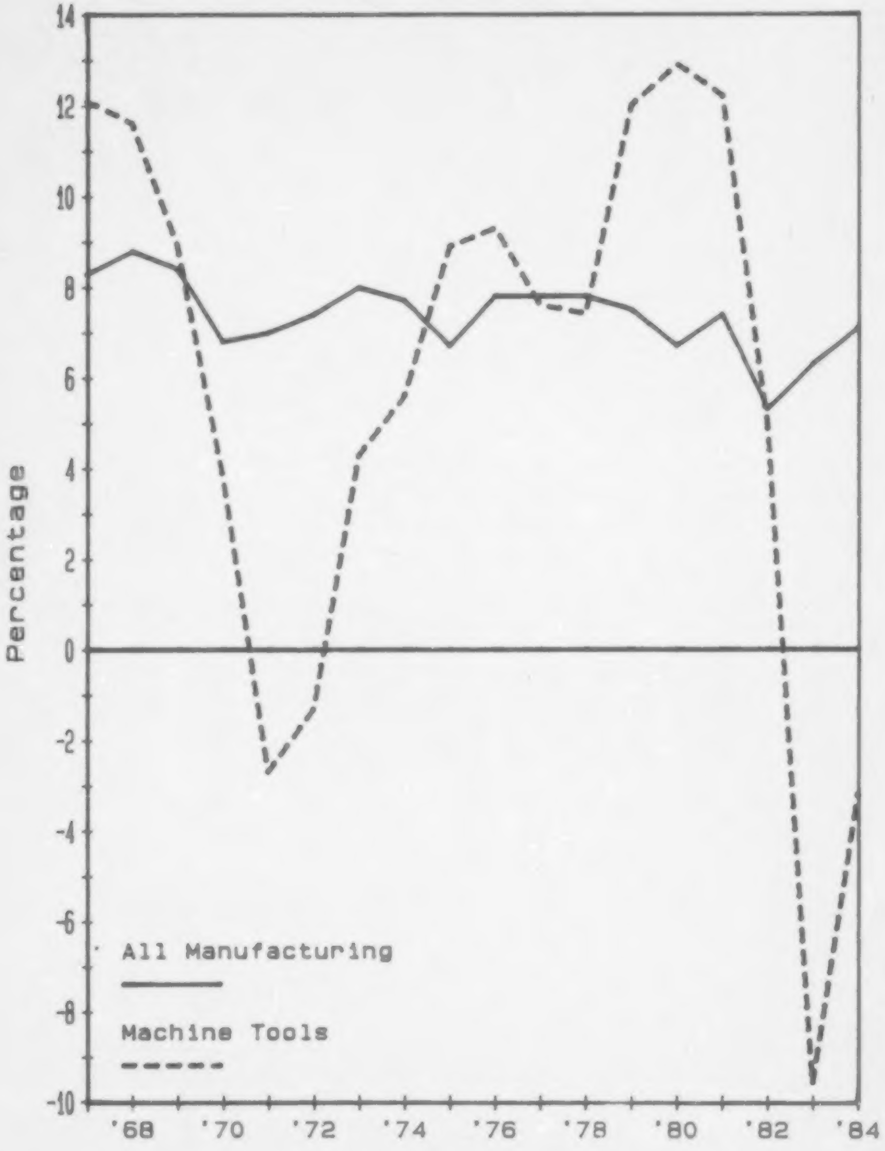
NA - Not Available.

(a) Data in this table prior to 1980 represents a composite of financial information for six publicly held machine tool companies. Companies included in the group have changed through time. Since 1980, the composite has included five companies. However, since the indicators are weighted according to the market value of shares outstanding, a shift in the composite's composition should not affect the indicators. Therefore, pre- and post-1980 data are comparable.

Source: Standard & Poor's Corporation, Data in original form, 1941-43 equals 10, taken from "Industry Surveys," a copyright of Standard & Poor's Corporation. "Industry Surveys" has a wide variety of additional information for the machine tool composite and individual companies.

Net Income Before Taxes as a Percent of Sales

All Manufacturing & Machine Tools
1967 to Date



AVERAGE NET INCOME OF ALL MANUFACTURING CORPORATIONS AND MACHINE TOOL COMPANIES SURVEYED

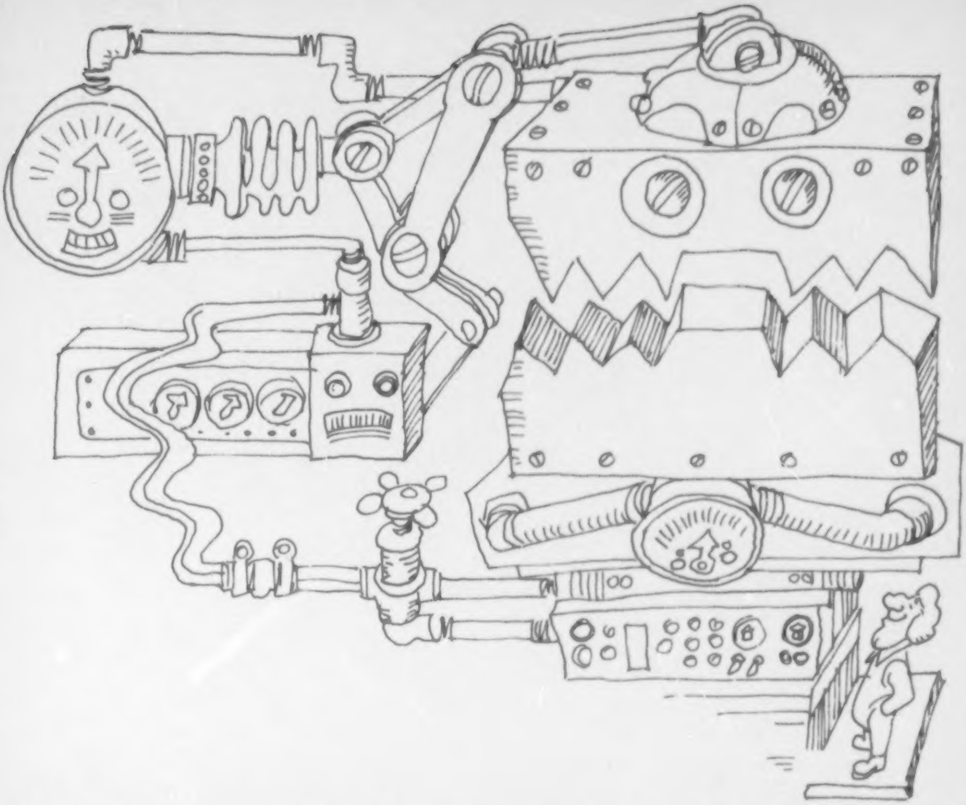
1967 to Date

	NET INCOME BEFORE TAXES			
	As Percent of Sales		As Percent of Assets	
Year	All Manufacturers	Machine Tool Manufacturers (a)	All Manufacturers	Machine Tool Manufacturers (a)
1967	8.3%	12.1%	10.9%	16.6%
1968	8.8	11.6	11.7	15.1
1969	8.4	8.9	10.7	10.6
1970	6.8	3.8	8.3	4.8
1971	7.0	(2.7)	8.7	(2.7)
1972	7.4	(1.3)	9.5	(1.4)
1973	8.0	4.3	11.0	4.8
1974	7.7	5.6	10.7	7.2
1975	6.7	8.9	8.8	12.7
1976	7.8	9.3	10.6	12.3
1977	7.8	7.6	13.5	12.8
1978	7.8	7.4	10.7	11.8
1979	7.5	12.0	11.1	16.9
1980	6.7	12.9	9.5	19.4
1981	7.4	12.2	10.5	18.0
1982	5.3	5.0	8.7	6.1
1983	6.3	(9.6)	7.9	(8.7)
1984	7.1	(3.2)	8.9	(3.4)

(a) Data based on the machine tool activities of 111 companies and divisions.

Note: Figures in parentheses represent negative figures.

Sources: National Machine Tool Builders' Association; U.S. Department of Commerce, Bureau of Census, "Quarterly Financial Report for Manufacturing Corporations" (Quarterly).



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MACHINE TOOLS IN USE

American Machinist magazine has been conducting surveys of metalworking equipment in use by American industry for over 50 years - a total of 13 complete Inventories. Through the years the impact of advancing technology, shifting industrial classifications and improved statistical techniques have brought about changes in procedures for compilation and publication of inventory data.

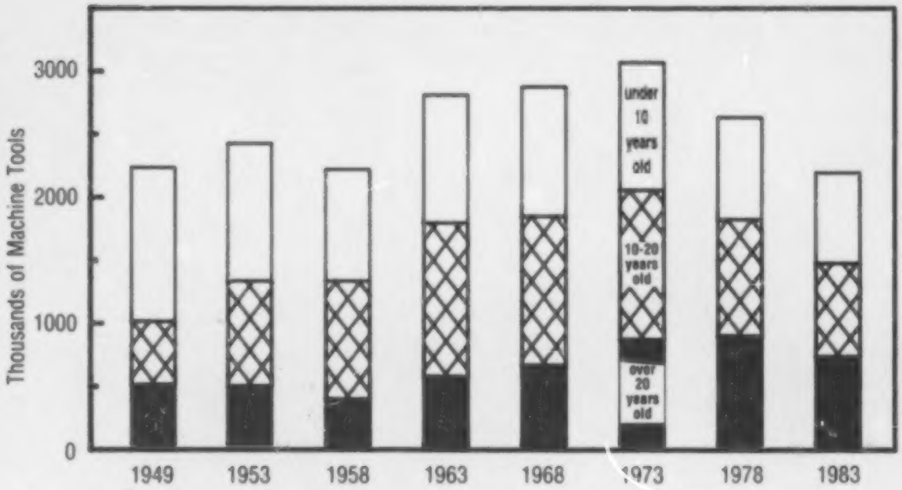
Through 1973, the Inventory was conducted every five years covering all the metalworking industries. The 12th Inventory was conducted over a period of three years with approximately one-third of metalworking surveyed each year from 1976 to 1978. The latest Inventory, the 13th of the series, returned to the format employed in the first eleven, i.e. surveying all metalworking industries in one year. The 13th Inventory was conducted in 1983 and its results were published late in the year. All of the tables and charts in this chapter have been updated to reflect this latest compilation.

The American Machinist Inventory is based on a sample survey and it is the nature of such surveys that the reliability of the data is greatest in the broader categories. The survey's reliability necessarily decreases as results are broken down into smaller and smaller cells. A broad breakdown, such as "grinding machine tools in the North Central States," will therefore tend to be more reliable than a very detailed breakdown such as "circular saws, over 20 years old, in New Mexico and Texas." Another limitation is the coverage of the survey. While the data compiled are believed to accurately reflect the number and types of machine tools in use in U.S. metalworking industries, the user should be aware of the sample's limitations. For all but the 12th Inventory, all of metalworking manufacturing was surveyed to arrive at tabulated results. In the 12th Inventory, estimates were made for metalworking plants with fewer than twenty employees as these establishments were not surveyed. Tables containing these estimates are so noted. Secondly, the coverage of the survey is based on employment totals, not the number of plants. For example, in the 1983 Inventory, the number of plants responding to the survey comprised only 7% of the total number of establishments with more than twenty employees recognized by the U.S. Bureau of Census. However, this 7% represented an employee base of approximately 25% of metalworking employment. This level of representation bolsters the survey's reliability.

Also included in this chapter is a chart of Inventory data showing the number of machine tools in use in seven industrial nations and their average age distribution. This chart brings to light the fact that while the U.S. has a very large stock of machine tools it is also a relatively old, somewhat obsolescent stock.

Additional information concerning the American Machinist Inventory may be obtained from Manufacturing Research Institute of American Machinist, 1221 Avenue of the Americas, New York, New York 10020.

Machine Tools in Use in Metalworking Industries



Source: American Machinist, "12th Inventory of Metalworking Equipment, 1976-1978."

TOTAL MACHINE TOOLS IN THE UNITED STATES
Estimated Number, 1983

Use or Location	Total	Metal Cutting	Metal Forming
TOTAL	2,896,754	2,247,833	648,921
Metalworking Industries (a)	2,192,754	1,702,833	489,921
Other Industries	380,000	275,000	105,000
Training	74,000	70,000	4,000
In Storage and Surplus	250,000	200,000	50,000

(a) As used here, metalworking industries are: furniture industry (SIC 25), primary metals industry (SIC 33), fabricated metal products industry (SIC 34), non-electrical machinery industry (SIC 35), electrical machinery industry (SIC 36), transportation equipment industry (SIC 37), precision instruments industry (SIC 38), and miscellaneous manufacturing industry (SIC 39).

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE
Metalworking Industries, 1963 to 1983
(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10-19 Years		Over 20 Years			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
1963									
All Metalworking	2,808.5	1,011.1	36.0	1,215.6	43.3	581.8	20.7	NA	NA
Non-Electrical Machy.	951.9	315.0	33.1	424.0	44.5	212.9	22.4	NA	NA
Metalworking Machy.	210.6	77.9	37.0	90.3	42.9	42.4	20.1	NA	NA
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1968									
All Metalworking	2,869.8	1,021.4	35.6	1,176.2	41.0	672.2	23.4	14.2	0.5
Non-Electrical Machy.	912.5	325.3	35.6	350.4	38.4	236.9	26.0	6.8	0.7
Metalworking Machy.	248.7	97.1	39.0	93.9	37.8	57.7	23.2	1.8	0.7
Machine Tools	NA	NA	NA	NA	NA	NA	NA	NA	NA
1973									
All Metalworking	3,065.5	1,009.8	32.9	1,185.1	38.7	870.6	8.4	28.6	0.9
Non-Electrical Machy.	1,103.6	379.8	34.4	410.9	37.2	312.9	28.4	15.1	1.4
Metalworking Machy.	274.5	105.5	38.4	102.3	37.3	66.6	24.3	3.3	1.2
Machine Tools	57.1	17.2	20.1	20.0	35.0	19.9	34.9	1.5	2.6
1976-1978 (a, b)									
All Metalworking	2,630.7	802.6	30.5	927.2	35.2	900.9	34.2	52.9	2.0
Non-Electrical Machy.	961.0	314.8	32.8	337.5	35.1	308.7	32.1	29.7	3.1
Metalworking Machy.	242.1	82.1	33.9	87.8	36.3	72.2	29.8	6.9	3.1
Machine Tools	69.5	16.0	23.0	25.6	36.8	27.8	40.0	2.6	3.7
1983 (b)									
All Metalworking	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Non-Electrical Machy.	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machy.	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9

NA - Not Available.

(a) Includes estimates of machines in plants with less than 20 employees.
(b) Machines 20 years old are included in the "Over 20 Years" category.
(c) Metal cutting industries only.

Source: McGraw hill, Inc. "American Machinist," Inventories of Metalworking Equipment, 1963-1983.

MACHINE TOOLS IN USE IN SEVEN INDUSTRIAL NATIONS
By Number and Age
(Number in Thousands)

			Percent of Total		
Country	Year	Total	Under 10 Years	10-19 Years	20 Years & Up
United States	1983	2,193	32.7%	34.0%	33.2%
West Germany (a)	1980	1,250	34.0	18.0	48.0
United Kingdom (b)	1982	775	42.3	30.5	27.2
Japan(c)	1981	918	36.4	28.0	35.6
France	1980	761	35.0	33.0	32.0
Italy (d)	1975	541	38.1	33.9	28.0
Canada	1978	211	35.8	30.4	33.8

(a) Machine tool age classifications are as follows: Under 10 Years, 10 to 14 Years, 15 Years & Up.
(b) Machine tool age classifications are as follows: Under 6 Years, 6 to 19 Years, 20 Years and Up.
(c) Machine tool age classifications are as follows: Under 8 Years, 8 to 12 Years, 20 Years and Up.
(d) Machine tool age classifications are as follows: Under 9 Years, 9 to 17 Years, Over 17 Years.

Source: McGraw Hill, Inc. "American Machinist."

MACHINE TOOLS IN USE
Metalworking Industries, 1983
(Number in Thousands and Percent of Total)

		By Age						With Numerical Control	
		Under 10 Years		10-19 Years		20 Years and Over			
Year-Industry	Total	Number	%	Number	%	Number	%	Number	%
TOTAL	2,192.8	717.9	32.7	746.4	34.0	728.5	33.2	103.3	4.7
Metal Furniture, Fixtures	26.6	6.9	26.0	11.3	42.3	8.4	31.7	0.6	2.3
Primary Metals	117.8	34.4	29.2	39.6	33.6	43.6	37.2	2.7	2.3
Fabricated Metal Products	518.9	149.4	28.8	179.3	34.5	190.3	36.7	14.5	2.8
Fab. Structural Metal Products	120.3	41.7	34.7	42.1	35.0	36.5	30.3	4.3	3.6
Screw Machine Products	85.7	21.6	25.2	31.3	36.5	32.8	38.3	1.4	1.6
Metal Stampings	96.2	23.6	24.6	32.3	33.6	40.3	41.9	1.9	1.9
Other Fab. Metal Products	216.8	62.4	28.8	73.6	33.9	80.8	37.3	6.9	3.2
Non-Electrical Machinery	805.3	285.3	35.4	272.4	33.8	247.6	30.7	52.5	6.5
Metalworking Machinery	202.0	74.1	36.7	68.1	33.7	59.8	29.6	11.8	5.8
Machine Tools	49.2	12.6	25.7	14.4	29.2	22.2	45.1	3.4	6.9
Special Industry Machy.	80.4	24.1	29.9	27.1	33.8	29.2	36.3	4.0	5.0
General Industrial Machy.	110.0	31.9	29.0	39.5	35.9	38.6	35.1	5.8	5.3
Other Non-Elec. Machy.	412.9	155.3	37.6	137.6	33.3	120.0	29.1	30.9	7.5
Electrical Machinery	245.7	85.3	34.7	90.9	37.0	69.4	28.3	10.8	4.4
Elec. Industrial Apparatus	41.4	13.8	33.2	15.0	36.3	12.6	30.5	1.8	4.3
Communications Equipment	36.6	14.0	38.4	13.6	37.1	9.0	24.5	2.6	7.1
Other Elec. Machinery	167.7	57.5	34.3	62.3	37.2	47.8	28.5	6.4	3.8
Transportation Equipment	303.0	89.0	29.4	92.7	30.6	121.2	40.0	15.3	5.0
Motor Vehicles Equip.	153.2	38.9	25.4	46.8	30.5	67.6	44.1	4.1	2.7
Aircraft and Parts	97.7	34.2	35.0	33.3	34.1	30.2	30.9	8.8	9.0
Other Trans. Equip.	52.0	15.9	30.6	12.6	24.2	23.5	45.2	2.4	4.6
Precision Instruments	109.6	41.3	37.7	40.0	36.5	28.3	25.8	4.9	4.4
Misc. Mfg. Industries	65.9	26.2	39.7	20.2	30.7	19.5	29.6	2.1	3.2

Note: Individual items may not add to totals due to rounding.

Source: American Machinist, "The 13th American Machinist Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major User Industry, 1983
(Number in Thousands)

	Total Machine Tools		Metal Cutting Machines		Metal Forming Machines	
Using Industry	Number	%	Number	% Under 10 Yrs. Old	Number	% Under 10 Yrs. Old
TOTAL	2,192.8	100.0%	1,702.8	34%	489.9	27%
Furniture & Fixtures	26.6	1.2%	10.8	34%	15.9	21%
Primary Metals Industries	117.8	5.4	88.5	30	29.3	29
Fabricated Metal Products	518.9	23.7	326.0	32	192.9	25
Ordnance & Accessories	24.3	1.1	20.7	20	3.7	18
Non-Electrical Machinery	805.3	36.7	714.8	36	90.5	30
Electrical Machy. & Equipment	245.7	11.2	177.9	36	67.7	31
Transportation Equipment	303.0	13.8	248.6	30	54.4	27
Precision Instruments	109.6	5.0	91.3	38	18.3	33
Miscellaneous Mfg. Industries	65.9	3.0	45.0	47	20.9	23

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

GEOGRAPHICAL DISTRIBUTION OF MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES, 1983
(By Number and Age Distribution)

Region and Area	Metal Cutting Machines					Metal Forming Machines					No. Units with NC		% Plants with NC		
	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Total Units	0-4 Years	5-9 Years	10-19 Years	20 Years & Over	Cutting	Forming	Turning	Mach. ctrs.	Forming
U.S.A.	1,702,833	14%	20%	34%	32%	489,921	9%	18%	36%	37%	94,012	9,296	26%	19%	8%
NORTHEAST															
Boston	101,472	15%	21%	33%	32%	27,531	9%	18%	34%	39%	5,641	504	28%	20%	8%
Bridgeport-Hartford	67,581	14	18	34	34	16,389	9	17	36	39	3,893	197	28	24	3
New York-Newark	120,299	15	22	35	28	38,954	10	18	37	35	6,707	936	18	16	6
Buffalo-Syracuse	49,202	12	18	33	37	11,713	9	17	34	41	2,375	154	31	23	10
Philadelphia-Camden	77,535	14	21	34	32	25,286	9	18	35	37	4,057	490	28	19	8
Pittsburgh-Wheeling	47,239	12	20	33	35	13,634	7	16	33	44	2,390	192	31	23	7
SOUTHEAST															
Baltimore	14,065	13	20	34	34	4,212	8	18	35	39	592	86	23	14	14
Richmond	61,169	14	19	35	32	17,231	9	18	38	35	3,340	352	32	23	11
Atlanta-New Orleans	112,738	15	20	33	32	36,520	10	18	36	35	6,362	866	22	13	8
MIDWEST															
Cleveland	75,272	13	19	34	34	21,717	8	17	35	40	3,827	269	27	18	5
Toledo	21,624	10	17	32	40	6,632	7	15	36	42	841	55	27	18	10
Cincinnati-Louisville	57,956	13	19	34	35	16,496	8	16	37	39	2,868	241	29	22	9
Detroit	106,983	13	18	32	37	27,936	8	16	34	42	5,134	319	24	18	3
Indianapolis	45,936	12	18	34	36	14,234	8	16	34	41	1,920	190	28	13	5
Chicago	218,646	13	20	34	32	68,100	9	18	36	37	12,336	1,333	23	16	9
Milwaukee	60,777	12	19	34	35	15,879	8	18	36	38	3,210	260	26	21	9
Minneapolis-St. Paul	34,421	13	21	35	31	9,613	9	18	37	36	1,703	189	31	21	11
St. Louis	49,624	13	20	35	33	18,373	9	17	37	37	1,979	295	21	14	10
SOUTHWEST															
Kansas City - Tulsa	41,236	16	21	32	31	10,470	10	19	35	36	2,677	220	39	27	10
Dallas-Houston	79,137	18	21	31	30	19,848	12	19	35	34	6,110	473	35	20	7
MOUNTAIN AND PACIFIC															
Denver	32,341	15	22	33	30	8,829	10	19	35	36	1,742	238	23	18	12
Seattle-Portland	27,619	15	22	33	31	6,936	11	19	36	34	1,388	155	20	17	6
San Francisco	44,650	16	21	33	29	11,817	11	19	37	33	2,504	292	18	16	9
Los Angeles	155,311	17	22	34	28	41,571	11	19	37	33	10,416	990	28	21	7

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES
By Major Type and Age, 1983

Type of Machine Tool	Plants With	Total Units	Change Since '78	Percent of Total	0-4 Years	5-9 Years	10-19 Years	20 Years and Over
GRAND TOTAL	—	2,192,754	−8%	100.0%	13%	20%	34%	33%
Non-NC Grinding Machines	75%	383,027	0%	17.5%	14%	22%	34%	31%
Non-NC Turning Machines	77	332,327	−14	15.2	10	16	35	40
Non-NC Drilling Machines	74	281,453	−18	12.8	10	18	36	36
Non-NC Milling Machines	74	218,479	−5	10.0	12	20	36	32
Mechanical Presses	43	198,973	−15	9.1	6	14	36	45
Cutoff & Sawing Machines	86	169,107	5	7.7	17	28	33	22
Non-NC Bending & Forming	41	77,285	2	3.5	11	19	38	32
Non-NC Punching & Shearing	41	66,363	9	3.0	11	20	37	32
Hydraulic Presses	38	53,292	−5	2.4	14	22	34	30
Honing, Lapping, Polishing	33	50,626	NA	2.3	12	23	35	30
Non-NC Boring Machines	28	40,462	−17	1.8	8	11	34	47
Gear-cutting & -finishing	10	34,834	−11	1.6	7	11	32	50
NC Turning Machines	26	33,352	22[illegible]	1.5	58	28	11	3
Tapping Machines	24	28,139	1	1.3	13	25	36	26
Machining Centers	19	24,003	26	1.1	58	26	15	1
Forging Machines	6	19,613	−4	0.9	6	11	30	54
Pneumatic Presses	8	17,656	NA	0.8	18	30	37	16
Broaching Machines	18	16,505	20	0.8	11	15	29	45
NC Milling Machines	16	15,929	209	0.7	44	27	22	6
Station-Type Machines	5	13,588	−25	0.6	16	20	32	31
Electrical-Machining Units	14	12,434	9	0.6	31	28	35	6
Other Non-NC Metal Cutting	4	12,075	NA	0.6	12	18	37	34
Threading Machines	13	11,703	−5	0.5	8	17	37	38
Other Non-NC Metalforming	3	11,255	−67	0.5	6	18	36	40
Coil-Processing Systems	6	10,852	−78	0.5	13	25	35	27
Thread-Rolling Machines	5	8,604	36	0.4	9	17	31	43
Diecasting Machines	2	8,095	−21	0.4	12	24	44	20
NC Drilling Machines	9	7,993	134	0.4	21	29	43	8
Multiple-Side Forming Mach.	2	7,003	−45	0.3	7	21	35	38
NC Punching & Shearing	8	6,223	277	0.3	37	29	26	8
Non-NC Thermal Cutting	8	5,302	−61	0.2	28	33	26	14
NC Boring Machines	7	5,064	68	0.2	29	22	33	17
Other NC Metalcutting	2	3,121	652	0.1	19	25	13	43
NC Bending & Forming	3	2,585	21	0.1	33	26	27	15
NC Grinding Machines	3	2,276	734	0.1	50	21	22	7
Sheet-, Plate-processing	2	1,634	NA	0.1	15	25	24	37
NC Thermal Cutting	3	1,034	NA	0.1	53	29	8	9
Other NC Metalforming	(a)	488	75	(b)	47	18	22	14

NA - Not Available

(a) Percentage is less than 1%.

(b) Percentage is less than 0.1%.

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

NUMERICALLY CONTROLLED MACHINE TOOLS IN USE IN METALWORKING INDUSTRIES

Number by Type of Machine and User Industry, 1983

	Metal Cutting						Metal Forming Total
Using Industry	Total	Turn	Bore	Drill	Mill	Machining Centers	
TOTAL	94,012	33,352	5,064	7,993	15,929	24,003	9,296
Metal Furniture and Fixtures	253	46	19	58	43	23	357
Primary Metals Industries	2,413	842	271	261	433	353	249
Fabricated Metal Products	10,841	4,348	500	1,121	1,676	1,652	3,622
Ordnance and Accessories	797	NA	NA	NA	NA	NA	16
Non-Electrical Machinery	50,698	18,592	2,935	4,205	7,876	13,917	1,843
Metalworking Machinery	11,713	2,716	858	1,136	2,410	3,005	85
Machine Tools	3,373	956	355	400	355	1,103	31
Special Industry Machinery	3,903	1,115	219	559	563	1,314	134
Electrical Machinery and Equipment	9,415	2,677	182	1,150	1,983	2,644	1,357
Transportation Equipment	14,397	4,922	907	718	2,145	4,127	887
Aircraft Engines and Parts	8,450	2,790	426	336	1,692	2,810	332
Precision Instruments	4,434	1,538	110	227	1,132	1,240	440
Miscellaneous Manufacturing Industries	1,561	387	140	253	641	47	541

NA - Not Available

Source: American Machinist, "13th Inventory of Metalworking Equipment, 1983."

SEPTEMBER 3–11, 1986 CHICAGO, IL U.S.A.

IMTS

The world of manufacturing technology

1986 INTERNATIONAL MACHINE TOOL SHOW

The International Machine Tool Show is an international exchange of ideas for greater productivity and efficiency. Held in Chicago during September of every even numbered year, IMTS features every type of equipment and accessory, from sophisticated computer and numerical controlled systems to standard shop equipment.

Most of all, IMTS is the "World of Manufacturing Technology," representing the best opportunity for metalworking people to stay abreast of the latest developments in the industry. If metalworking is your profession, IMTS is the most important trade show you can attend.

Sponsored by: national machine tool builders' association

Abbreviations

and

Explanation of Terms

ABBREVIATIONS

ADR — The Asset Depreciation Range System

BEA — Bureau of Economic Analysis

BLS — Bureau of Labor Statistics

BTN — Brussels Tariff Nomenclature

CCC — Customs Co-Operation Council

CECIMO — Comité Européen de Coopération des Industries de la Machine Outil

C.I.F. — Cost, Insurance and Freight. Under these terms, the seller quotes a price which includes the cost of the goods, marine insurance and the transportation charges to a specified point of destination.

D — Withheld to avoid disclosing figures for individual companies

E — Estimate

EEC — European Economic Community

F.A.S. — Free Alongside Ship. Prices specified under these export terms provide that the seller delivers the goods to be exported alongside the overseas vessel within reach of its loading equipment.

F.O.B. — Free on Board. Seller is required to place goods aboard the equipment of the transporting carrier without cost to the buyer. The term F.O.B. must be qualified by a name destination.

FTC — Federal Trade Commission

GNP — Gross National Product

ILO — International Labor Organization

ITC — International Trade Commission

NA — Not Available

NC — Numerically Controlled

NEC — Not Elsewhere Classified

NMTBA — National Machine Tool Builders' Association

P — Preliminary

R — Revised

S — Estimate did not meet Publication Standards

SEC — Securities and Exchange Commission

S.I.C. — Standard Industrial Classification

SITC — Standard International Trade Classification of the United Nations

TSUSA — Tariff Schedules of the U.S., Annotated

U.N. — United Nations

VDMA — Verein Deutscher Maschinenbauanstalten

VDW — Fachgemeinschaft Werkzeugmaschinen in VDMA

Z — Figure below the Minimum Unit of Measure Selected

EXPLANATION OF TERMS

ACCESSIONS
........See LABOR TURNOVER

AIRCRAFT, MISSILES AND PARTS
........Industry Group, conforming to the Standard Industrial Classification. Consists of Industry Group, SIC 372, Aircraft and Parts, and SIC 376, Establishments Primarily Engaged in Manufacturing Complete Guided Missiles and Space Vehicles and Parts.

ASSETS, NET
........Total net assets are the sum of all recorded assets after reducing such amount by allowance or reserve for bad debts, depreciation and amortization, but before deducting any liabilities, mortgages or other indebtedness.

AVERAGE HOURLY EARNINGS
........See EARNINGS

AVERAGE STRAIGHT-TIME HOURLY EARNINGS
........See EARNINGS

AVERAGE WEEKLY HOURS
........See HOURS, AVERAGE WEEKLY

AVERAGE WEEKLY EARNINGS
........See EARNINGS

BACKLOG
........See ORDERS, UNFILLED

CANCELLATIONS
........Gross new orders less cancellations equal net new orders in the order data of NMTBA. Cancellation provisions are usually specified in purchase orders.

CAPACITY UTILIZATION
........There are seven different series on capacity utilization. The most widely used are the indexes published by the Federal Reserve Board, the U.S. Department of Commerce's Bureau of Economic Analysis and McGraw-Hill Publications. Though their statistical methodology varies, each of these indexes attempts to present a measure of current physical industrial output levels as they compare to the potential level of output if all available productive facilities were in full use. Some series measure utilization according to absolute output potential while others measure utilization relative to that portion of absolute capacity which management prefers. While these differences lead to divergent index numbers, quite often the relative changes of the different indexes parallel each other.

CAPITAL EXPENDITURES
........See PLANT AND EQUIPMENT

CAPITAL GOOD INDUSTRIES
........This category is defined as the Nonelectrical Machinery industry, exclusive of farm machinery and equipment producers and machinery shops, the Electrical Machinery Industry, exclusive of household appliances and electronic components manufacturers, and the non-defense portion of the following industries: Shipbuilding and Repairing, Railroad Equipment, Communication Equipment, Aircraft and Parts, and Ordnance plus Defense Products.

COMPENSATION
........See EARNINGS; PAYROLL

COMPENSATION, SUPPLEMENTARY
........Supplementary compensation statistics fall into two broad categories and are intended to capture

payroll expenditures made by employers which are in addition to the stated hourly wage rate. These categories are:

1. Payments to Workers—which includes payments for paid leave time, premiums for overtime, weekend, holiday, and shift work; non-production bonuses (e.g., Christmas); and terminal payments.
2. Expenditures in Addition to Payroll—which encompass expenditures for which the employer irrevocably makes a payment under the provisions of a legally required insurance program or private welfare plan; e.g., social security, unemployment compensation and other insurance for the benefit of the workers; life, accident, and health insurance; pension and retirement plans; vacation and holiday funds; severance and supplemental unemployment benefit plans; and savings and thrift plans.

For further explanation, see the "BLS Handbook of Methods, U.S. Bureau of Labor Statistics, Bulletin 1910."

CONSTANT DOLLARS

........Constant dollar estimates represent an effort to remove the effects of price changes from statistical series. In general, they are arrived at by dividing current dollar estimates by appropriate price indexes.

Any changes in such a series would reflect only changes in the "real" (physical) volume of output.

........See IMPLICIT PRICE DEFLATOR.

CONSUMER PRICE INDEX

........See PRICE INDEX

CONSUMPTION

........The term consumption, as used in this publication, refers to the domestic production, less exports, plus imports of a particular commodity.

CONTROLS

........See NUMERICAL CONTROLS

CORPORATE CAPITAL CONSUMPTION ALLOWANCES

........Accounting charges which reflect estimates of wear and tear, obsolescence, destruction, and accidental losses of physical capital.

Gross National Product less capital consumption allowances is referred to as Net National Product.

COST OF MATERIALS

........See MATERIALS, COST OF

DEFENSE PRODUCTS

........The "defense products" category for manufacturers' shipments, orders, and inventories consists of communication equipment, complete aircraft and parts, shipbuilding and military tank vehicles and ordnance. See Census Bureau, Current Industrial Report, Series: M3-1 and MA-175 Shipments of Defense-oriented Industries.

DEPRECIATION

........Depreciation is the general conversion of the depreciable cost of a fixed asset into expense, spread over its remaining life. There are numerous depreciation methods, all based on a periodic charge to an expense account and a corresponding credit to a depreciation reserve.

Plant (Structure and Additions) depreciation and amortization are usually reported separately from machinery and equipment depreciation.

DIFFERENTIAL (SHIFT)

........Shift differentials represent premium payments for work on late or night shifts. They are part of Supplementary Compensation (See COMPENSATION, SUPPLEMENTARY) paid to workers.

DOMESTIC (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........Totals are the sum of "domestic" and "foreign." "Domestic" represents business activity originating within or destined for the United States, its territories and possessions.

DURABLE GOODS

........An item, destined for either producers or consumers, that in normal use is likely to last longer than three years. Consumer durable goods include automobiles, appliances, jewelry and books. Producer durable goods include a wide range of machinery and equipment.

DURABLE GOODS INDUSTRIES

........Comprise manufacturing major industry groups with SIC Codes 24, 25, and 32 through 38. All other manufacturing major industry groups in SIC Codes 20 through 38 are considered as nondurable goods manufacturing industry groups.

EARNINGS

........Earnings are the actual return to the worker for a stated period of time. Irregular bonuses, retroactive items, payments of various welfare benefits, payroll taxes paid by employers are excluded.

..........AVERAGE HOURLY EARNINGS

........are on a "gross" basis, reflecting not only changes in basic hourly and incentive wage rates, but also such variable factors as premium pay for overtime and late shift work, and changes in output of workers paid on an incentive plan.

..........AVERAGE STRAIGHT-TIME HOURLY EARNINGS

........exclude premium payments for overtime and for work on weekends, holidays, and late shifts. Regular day-shift wages or salaries paid per hour worked during a standard workweek are included; incentive pay, production bonuses, and cost of living payments are included in these statistics, Non-production bonuses are excluded.

.........AVERAGE WEEKLY EARNINGS

........are derived by multiplying average weekly hours by hourly earnings.

ELECTRICAL MACHINERY INDUSTRY

........Major Group 36, Electrical Machinery, Equipment and Supplies, according to the Standard Industrial Classification, comprises SIC Industry Groups:

..........361. Electrical Transmission and Distribution Equipment
362. Electrical Industrial Apparatus
363. Household Appliances
364. Electrical Lighting and Wiring Equipment
365. Radio and Television Receiving Sets
366. Communication Equipment
367. Electronic Components and Accessories
369. Miscellaneous Electrical Machinery, Equipment and Supplies

EQUITY

........See STOCKHOLDER'S EQUITY

ESTABLISHMENT

........The "establishment" is the basis for reporting to the Census of Manufactures. It is an operating facility in a single location. Where one facility engages in different lines of activity, it is required to submit separate reports, provided that plant records permit such a separation and the activities are substantial in size.

EXCHANGE RATES

........An exchange rate is nothing more than the purchase price of a unit of one nation's currency expressed in terms of another nation's currency. The exchange rates cited in this text are the market rates published by the International Monetary Fund.

EXPENDITURES ON NEW PLANT AND EQUIPMENT

........See PLANT AND EQUIPMENT

EXPORTS

........EXPORTS OF DOMESTIC MERCHANDISE—TOTAL

.........Data are compiled from copies of Shippers' Export Declarations filed with U.S. Customs officials. Export values are those declared by the shipper at the time of exportation. Values of containers and coverings are included. Freight, insurance and other changes to the point of export are included, but freight and other charges from the place of departure in the United States to the destination in the foreign country are not.

A description of the procedures used for compiling these statistics appears in Report FT 410, United States Exports, Commodity by Country, published by the U.S. Bureau of the Census.

MANUFACTURERS' EXPORT SHIPMENTS

........These data are based on manufacturers' factory shipments for exports. For machine tools the value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines. Rebuilt machinery, machine tools designed for use in home workshops, laboratories, garages, service shops, or for modelmaking are excluded.

FROM FOREIGN COUNTRIES

........Export statistics supplied by the United Nations and foreign countries are defined by the originating agency and may not be comparable to U.S. definitions.

........The International Trade Statistics Center, Statistical Office of the United Nations prepares some special data on the U.S. share of exports from fourteen supplier countries to the world and to 90 countries of destination. The definition of machine tools for this series is the Standard International Trade Classification, Revised (SITC) of the United Nations, SITC NO. 715.1, Machine Tools for Working Metals. (See MARKET SHARE).

Exports are value F.O.B. port of shipment by all reporting countries, except Canada which values exports F.O.B. inland point of shipment and the United States which values exports F.A.S.

U.S. and U.K. data refer to exports of domestic merchandise; data for Denmark, Japan, Norway and Sweden are for exports including re-exports; Canadian data are for general exports.

The table on "Machine Tool Exports from 14 Supplier Countries to the U.S." appearing in this text is based on the U.N. figures.

The special tables on German, British, Italian and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

The definition of "Exports of Domestic Merchandise—Total" is broader than the definition of "Manufacturers' Export Shipments." Exports in the first category should, therefore, be larger than those in the second category. While this generally is the case, it is not always the case. In certain classifications, manufacturers' export shipments in some years exceed total exports of domestic merchandise. The reasons for this may lie in differences in the time of reporting, difference in classifying certain machine tools, and, possibly, in errors of classification on Shippers Export Declarations.

Differences will also be noted between U.S. exports to a foreign country and the imports from the U.S. reported by that country for the same year. The reverse also occurs—U.S. imports from a given country may differ from the exports to the U.S. reported for the same year by that country.

This may be due to differences in the time the exports and imports were reported, differences in determining values, differences in the classification of commodities, differences in conversion of currencies, and errors in classification or computation.

FABRICATED METAL PRODUCTS INDUSTRY

........The Production Indexes published in this book appear as compiled by the Board of Governors of the Federal Reserve System.

........See INDUSTRIAL PRODUCTION

........in all other tables consists of SIC Major Group 34, Fabricated Metal Products except Machinery and Transportation Equipment. The SIC Industry Groups included are:

........341. Metal Cans
342. Cutlery, Hand Tools, and General Hardware
343. Heating Equipment (except electrical) and Plumbing Fixtures
344. Fabricated Structural Metal Products
345. Screw Machine Products, and Bolts, Nuts, Screws, Rivets and Washers
346. Metal Stampings
347. Coating, Engraving and Allied Services
348. Ordnance and Accessories
349. Miscellaneous Fabricated Metal Products.

FOREIGN (ORDERS, SHIPMENTS, UNFILLED ORDERS, CANCELLATIONS)

........"Totals" are the sum of "domestic" and "foreign." "Foreign" represents all business activity destined for other than the United States, its territories or possessions.

FOREIGN INVESTMENT, DIRECT U.S.

........Direct U.S. foreign investment consists of net capital outflows from the U.S. into businesses in which U.S. residents have significant control. Reinvested returns of the foreign investment are included in these data but portfolio holdings of foreign securities are excluded.

FOREIGN TRADE

........See EXPORTS; IMPORTS

FRINGE BENEFITS

........See COMPENSATION, SUPPLEMENTARY

FURNITURE AND FIXTURE INDUSTRY

........Major Group 25, Furniture and Fixtures, according to the Standard Industrial Classification, comprises SIC Industry Groups:

........251. Household Furniture
252. Office Furniture
253. Public Buildings and Related Furniture
254. Partitions, Shelving, Lockers, and Office and Store Fixtures
259. Miscellaneous Furniture and Fixtures.

GNP—GROSS NATIONAL PRODUCT

........Gross National Product or expenditure is the market value of the output of goods and services produced by the nation's economy before deduction of depreciation charges and other allowances for business and institutional consumption of durable goods.

Gross national product comprises the purchase of goods and services by consumers and government, gross private domestic investment, and net exports. Beginning with 1960, the estimates include data for Alaska and Hawaii.

GROSS NEW ORDERS

........SEE ORDERS

GROSS PRIVATE DOMESTIC INVESTMENT

........Consists of fixed investment and change in business inventories. Fixed investment measures additions to, and replacements of, private capital brought about through net acquisitions by businesses and non-profit institutions of durable equipment and structures for business and residential purposes.

HEALTH, INSURANCE AND RETIREMENT PLANS

........See COMPENSATION, SUPPLEMENTARY

HOLIDAYS, PAID

........See COMPENSATION, SUPPLEMENTARY

HOURS, AVERAGE WEEKLY

........These statistics are derived by dividing the total of all hours worked in a reporting establishment or industry, including overtime, by the number of employees who received remuneration for their work. Such data differs from standard or scheduled hours.

HOURS, OVERTIME

........Overtime hours represent that portion of the gross average weekly hours which were in excess of regular hours and for which premium payments were made.

Overtime hours are premium hours by definition.

HOURS, SCHEDULED, WEEKLY

........Refers to the predominant work schedule for full-time production workers employed on the day shift.

IMPLICIT PRICE DEFLATOR

........The implicit price deflator is the price index for gross national product. It is a weighted average of the price indexes used to deflate the components of GNP. The implicit weights used are expenditures in the current period. The implicit price index is generally regarded as the best single measure of broad price movement in the economy as a whole.

IMPORTS

........Imports are classified as "general imports" or "imports for consumption." In this volume, we generally speak of "imports for consumption." These are entries for immediate consumption plus merchandise withdrawn from bonded storage warehouses for consumption.

IMPORTS INTO THE UNITED STATES

........Data are compiled from Import Entries filed with U.S. Customs officials. Import values are in general based on the market value or price in the foreign country at the time of exportation of such merchandise. These values include the cost of containers and coverings, as well as other charges and expenses incidental to placing the merchandise in condition, packed ready for shipment to the United States, but exclude import duties, insurance, ocean freight and other charges incidental to arrival of the goods in the United States. The foreign values of imported merchandise are converted into U.S. currency at the rate of excnange prevailing on the day the merchandise is shipped to the United States (but the same rate of exchange may be used for each currency for a 3-month period so long as the rate on any particular day did not vary from it by 5 percent or more).

........Machine tool import data includes used and rebuilt machine tools, replacement parts and home workshop tools. Also included may be some metalworking machinery other than machine tools.

Because the SIC and the statistical export and import classifications were developed independently, there are considerable difficulties in meshing the three systems. Many adjustments are required for comparability. The Census Bureau has published several imports in which comparability is attempted. Among these are annual volumes on U.S. Commodity Exports as Related to Output, U.S. Imports for Consumption and General Imports, SIC-Based Product Classification, by Area, FT 210, and U.S. Exports of Domestic Merchandise, SIC-Based Products and Area, FT 610.

A description of the procedures for compiling import statistics appears in Report FT 135, U. S. Imports, General and Consumption, Schedule A, Commodity and Country, published by the U.S. Bureau of the Census.

IMPORTS INTO FOREIGN COUNTRIES

........The separate tables on German, British, Italian, and Japanese foreign trade data are based on statistics prepared in those countries.

NOTE:

Differences will be noted between U.S. imports from a foreign country and the exports to the U.S. from that country for the same year. The reverse also occurs—U.S. exports to a given country may differ from the imports from the U.S. reported by that country for the same year. These differences may be due to differences in the time the imports and exports were reported, differences in determining values, differences in classification of commodities, differences in the conversion of currencies, and errors in classification or computation.

INCOME

........NET OPERATING INCOME.

........is total net sales less total operating costs.

NET INCOME (Before Income Taxes).

........is Net Operating Income plus or minus "Other Income and Expense."

OTHER INCOME AND EXPENSE.

........includes interest, income, royalty income, capital gains and losses, interest expense, cash discounts, etc.

NET INCOME (After Income Taxes).

........equals Net Income (Before Income Taxes) less all income taxes.

INDUSTRIAL PRODUCTION, TOTAL

........A measure of the physical output of U.S. manufacturing, mining, and utility industries compiled monthly by the Board of Governors of the Federal Reserve System. Covering about 35% of the total U.S. output of goods and services, the index includes a representative group of products, ranging from pig iron and cotton yarn to machine tools and electricity. It excludes agriculture, construction, and service industries. The relative importance assigned to individual products is based on quantity and value data determined from recent government censuses. Manufacturing accounts for 88.55% of the index, mineral production for 6.37%, and utilities for 5.08%. Current output is expressed as a percentage of annual production levels during 1967.

INSTRUMENTS AND RELATED PRODUCTS

........Major Group 38. Measuring, Analyzing and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks, according to the Standard Industrial Classification, comprises SIC Industry Groups.

........381. Engineering, Laboratory, Scientific and Research Instruments and Associated Equipment
382. Measuring and Controlling Instruments
383. Optical Instruments and Lenses
384. Surgical, Medical, and Dental Instruments and Supplies
385. Ophthalmic Goods
386. Photographic Equipment and Supplies
387. Watches, Clocks, Clockwork Operated Devices, and Parts

INVENTORIES

........End of month stocks of manufacturing establishments regardless of stage of fabrication. These inventories are valued at cost in the economic and statistical indicators, but are valued at current prices in the National Income and Product Accounts (which measure change in business inventories).

LABOR TURNOVER

........Labor turnover is the gross movement of wage and salary workers into and out of employed status with respect to individual establishments. This movement, which relates to a calendar month, is divided into two broad types: accessions (new hires and rehires) and separations (terminations of employment initiated by either employer or employee). Data for each type of action is accumulated for a calendar month and expressed as a rate per 100 employees. The data relate to all employees, whether full- or part-time, permanent or temporary, including executive, office, sales, other salaried personnel and production workers.

ACCESSIONS

........are the total number of permanent and temporary additions to the employment roll including both new and rehired employees.

NEW HIRES

........are temporary or permanent additions to the employment roll of persons who have never before been employed in the establishment.

OTHER ACCESSIONS

........which are not published separately but are included in total accessions, are all additions to the employment roll which are not classified as new hires.

SEPARATIONS

........are terminations of employment during the calendar month and are classified according to cause, quits, layoffs, and other separations, as defined below.

........QUITS

....are terminations of employment initiated by employees, failure to report after being hired, and unauthorized absences.

LAYOFFS

....are suspensions without pay lasting or expected to last more than 7 consecutive calendar days, initiated by the employer without prejudice to the worker.

OTHER SEPARATIONS

....are terminations of employment because of discharge, permanent disability, death, retirement, etc.

LAYOFFS

........See LABOR TURNOVER.

LEADING INDICATORS

........A set of economic time series, each of which usually reaches business cycle peaks and troughs ahead of general economic activity. While there are forty distinctly recognized leading indicators, only 12 are included in the widely publicized "Composite Index of Leading Indicators".

MACHINE TOOL INDUSTRY

........The machine tool industry covers establishments primarily engaged in producing metal cutting type machine tools and metal forming type machine tools. The U.S. Bureau of the Census has assigned industry SIC codes 3541 and 3542 to these industries.

An establishment is primarily engaged in the machine tool industry if the value of machine tools produced exceeds in value the production of products of other industries.

Because many establishments classified as being within the machine tool industry produce not only machine tools (their "primary products") but also other products (their "secondary products"), the "machine tool industry" figures do not measure machine tool activities only. In 1972, for instance, only 86 per cent of the value of shipments of the "metal cutting machine tool industry" consisted of metal cutting machine tools. The most important other products shipped were machine tool accessories and measuring devices.

While not all the shipments of the machine tool industry were made up of machine tools, some other industries did produce machine tools as their "secondary products." The 1972 Census of Manufactures showed that 90 per cent of all metal cutting machine tools were produced by the "metal cutting machine tool industry." The remaining 10 per cent were shipped by other industries. The "machine tool industry" statistics are important because they permit a measurement of the economic status of the plants which make machine tools their major business—their location, employment, payroll, etc. They are less reliable if we want to measure total machine tool production and shipments. To get the facts on total machine tool production, we should look at "Shipments"—see separate entry.

MACHINE TOOL PRODUCTS
........See SHIPMENTS

MACHINE TOOL SHIPMENTS
........See SHIPMENTS

MACHINE TOOLS, COMPLETE
........Machine tools (See MACHINE TOOLS, DEFINITION) as shipped, including all accessories, attachments, and numerical controls that are ordered and shipped with the machines.

MACHINE TOOLS, DEFINITION
........Machine tools are either metal cutting machines or metal forming machines.

METAL CUTTING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator when in use, that shape metal by cutting or use of electrical techniques. Machine tools of the metal cutting type are classified under SIC product codes, the first four digits of which are 3541.

METAL FORMING TYPES
........of machine tools are power driven machines, not supported in the hands of an operator while in use, for pressing, forging, hammering, extruding, shearing, bending or die casting metal into shape. Machine tools of the metal forming type are classified under SIC product codes, the first four digits of which are 3542.

MACHINERY, EXCEPT ELECTRICAL
........See NONELECTRICAL MACHINERY

MACHINERY AND EQUIPMENT INDUSTRIES
........are classified as a supplementary market category for manufacturers' orders, inventories and shipments. The other categories are "consumer durables" and "defense products." (See separate item—DEFENSE.)

........MACHINERY AND EQUIPMENT INDUSTRIES CATEGORY, consists of,
....nonelectrical machinery
....See NONELECTRICAL MACHINERY, but excluding farm machinery and machine shops; electrical machinery
....See ELECTRICAL MACHINERY, but excluding household appliances, communication equipment and electronic components; shipbuilding and repairing; and railroad and streetcar equipment.

MAJOR USERS—MAJOR USER CATEGORIES
........The major users of machine tools are the nonelectrical machinery industry, the fabricated metal products industry, the electrical machinery and equipment industry and other industry groups (see individual industry groups) listed in the inventory section of this volume.

MAN-HOURS
........All plant man-hours of production and related workers. Represents all man-hours worked or paid

for including actual overtime hours. Excludes hours paid for vacation, holidays or sick leave when the employee was not at the plant.

MANUFACTURERS' EXPORT SHIPMENTS
........See EXPORTS

MANUFACTURERS' NEW ORDERS
........See ORDERS

MANUFACTURERS' SHIPMENTS
........See SHIPMENTS

MARKET CATEGORY
........Major User Categories are classified either by Industry Group or by Market Category.
........See MAJOR USERS, DEFENSE, and MACHINERY AND EQUIPMENT INDUSTRIES

MARKET SHARE:
........Market Share defines what portion of a country's total imports of a specific commodity are attributable to a specific country of origin. The table in Chapter 6 of this text details this data for machine tool exports from the major Western industrial nations.

MATERIALS, COST OF
........"Cost" is defined as the direct charges actually paid or payable for items consumed or put into production during one year, after discounts, and including freight charges and other direct charges incurred by the establishment in acquiring the materials.

........Cost of materials includes:
........the total delivered cost of all raw materials, semi-finished goods, parts, components, containers, scrap, and supplies consumed or put into production during the year:
........the amount paid for electric energy purchased;
........the amount paid for all fuels consumed for heat, power, or the generation of electricity;
........the cost of work done by others on materials or parts furnished by manufacturing establishments (contract work);
........the cost of products bought and resold in the same condition.
....cost of materials excludes the cost of services used, such as,
....advertising, insurance, telephone, etc.;
........research development, and consulting services;
........overhead costs, such as depreciation charges, rent, interest, royalties, etc.;
........expense items chargeable to fixed asset accounts.

METAL FORMING
........See MACHINE TOOLS

METAL CUTTING
........See MACHINE TOOLS

METALWORKING INDUSTRY
........Industry Group 354, Metalworking Machinery and Equipment according to the Standard Industrial Classification. This industry group comprises the following industries,
........3541. Machine Tools, Metal Cutting Types
3542. Machine Tools, Metal Forming Types
3544. Special Dies and Tools, Die Sets, Jigs and Fixtures
3545. Machine Tool Accessories and Measuring Devices
3546. Power Driven Hand Tools
3547. Rolling Mill Machinery and Equipment
3549. Metalworking Machinery, N.E.C.

MOTOR VEHICLES AND PARTS INDUSTRY
........Industry Group 371. Motor Vehicles and Motor Vehicle Equipment, according to the Standard Industrial Classification, comprises the following industries.
3711. Motor Vehicles
3712. Passenger Car Bodies
3713. Truck and Bus Bodies
3714. Motor Vehicle Parts and Accessories
3715. Truck Trailers (Full)

NC
........See NUMERICAL CONTROLS

NET ASSETS

........See ASSETS, NET

NET INCOME

........See INCOME

NET NEW ORDERS

........See ORDERS

NET OPERATING PROFIT

........See INCOME

NET PROFIT ON SALES

........See INCOME

NET SALES

........See SALES

NEW HIRES

........See LABOR TURNOVER

NONELECTRICAL MACHINERY INDUSTRY

........Major Group 35, Machinery, except Electrical, according to the Standard Industrial Classification, comprises,

........351. Engines and Turbines
352. Farm Machinery and Equipment
353. Construction, Mining, and Materials Handling Machinery and Equipment
354. Metalworking Machinery and Equipment
355. Special Industry Machinery, Except Metalworking Machinery
356. General Industrial Machinery and Equipment
357. Office, Computing, and Accounting Machines
358. Refrigeration and Service Industry Machinery
359. Miscellaneous Machinery, Except Electrical

NUMERICAL CONTROLS

........Machine tool control systems which operate a machine by means of numerically coded programs inserted or fed into the systems on tape, punched cards, dials, plugs, preset switches or by playback of prerecorded operating programs.

OPERATING PROFIT

........See INCOME, NET OPERATING

ORDERS

........CENSUS SERIES ON SHIPMENTS, INVENTORIES AND ORDERS

........NEW ORDERS, NET,

....represent gross new orders net of cancellations received during the period. The series of new orders is adjusted for the number of trading days and length of calendar month prior to seasonal adjustment.

UNFILLED ORDERS

....at the end of a reporting period are orders that have not passed through the sales account and are equal to unfilled orders at the beginning of the period plus net new orders received during the period less net sales. Estimates for unfilled orders are obtained for each detailed category by multiplying the estimate for the preceding month by the link relatives based on a matched sample of reporting companies. The data for each company are inflated by their sampling weights before being summarized.

........NMTBA SERIES ON NEW ORDERS AND SHIPMENTS

........GROSS NEW ORDERS, minus CANCELLATIONS, equal NET NEW ORDERS

....The data are collected from participating companies and expanded to industry totals. The totals are adjusted periodically to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include only complete new machine tools and the accessories, attachments and tools ordered with them. They include only orders for machines to be built and assembled in the United States.

UNFILLED ORDERS

....Unfilled orders at the end of the reporting month are unfilled orders at the first of the month, plus new orders, less cancellations and less shipments. Any adjustments (due to corrections, price changes, etc.) are made through adjustments in cancellations, shipments or orders.

ORDNANCE AND ACCESSORIES, EXCEPT VEHICLES AND GUIDED MISSILES

........Major Group 348, Ordnance and Accessories, Except Vehicles and Guided Missiles, according to the Standard Industrial Classification, comprises Industry Groups

........3482. Small Arms Ammunition
3483. Ammunition, Except for Small Arms, not Elsewhere Classified
3484. Small Arms
3489. Ordnance and Accessories, Not Elsewhere Classified

OVERTIME

........See HOURS, OVERTIME

PAYROLL

........Includes the gross earnings paid in the calendar year to all employees on the payroll of operating manufacturing establishments.

Includes all forms of compensation directly to workers such as salaries, wages, commissions, dismissal pay, all bonuses, vacation and sick leave pay, and compensation in kind prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds.

Does not include employers' Social Security contributions or other non-payroll labor costs such as employees' pension plans, group insurance premiums, and workmen's compensation.

PLANT AND EQUIPMENT, EXPENDITURES FOR NEW

........New plant and equipment expenditures refer to all costs (both replacement and expansion) chargeable to fixed asset accounts and for which depreciation accounts (see DEPRECIATION) are ordinarily maintained. Included in the totals are expenditures for new construction, machinery, and new equipment (automobiles, trucks, and other transportation equipment, furniture and fixtures, office machinery and all other new equipment). The figures do not include expenditures for land and mineral rights, maintenance and repair, used plant and equipment, and expenditures made in foreign countries.

PRECISION INSTRUMENTS

........This classification, used in the American Machinist 12th Inventory, is not listed in the Standard Industrial Classification. The closest category is SIC Major Group 38.

........See INSTRUMENTS AND RELATED PRODUCTS

PRICE INDEX ....

The CONSUMER PRICE INDEX measures the effect of price change on the living costs of all urban consumers. It is calculated by comparing, from one period to the next, the cost of a "market basket" of goods and services usually purchased by this particular population group. For more detail, see "The Consumer Price Index, A Short Description of the Index as Revised", U.S. Bureau of Labor Statistics.

The PRODUCER PRICE INDEX is designed to show the general rate and direction of the composite of price movements in primary markets. It is designed to measure "real" price changes between two periods of time, i.e. to measure price changes not influenced by changes in quality, quantity, terms of sale, level of distribution, unit prices or source of price. For a more detailed description, see U.S. Bureau of Labor Statistics Bulletin 1910, "BLS Handbook of Methods".

PRIMARY PRODUCTS

........The products of an establishment which exceed in value its production of products of any other single industry.

PRODUCERS' DURABLE EQUIPMENT

........Includes the new and replacement purchase of various types of machinery, automobiles, trucks and other equipment used by the private sector in the production of goods and services.

PRODUCTION WORKERS

........Production and related workers include working foremen and all non-supervisory workers (including leadmen and trainees) engaged in fabricating, processing, assembling, inspection, receiving, storage, handling, janitorial and watchman services, product development, auxiliary production for plant's own use, and record keeping and services closely associated with the above production operations.

PRODUCTIVITY

........The total output index divided by the labor input index, The labor input index is the index of hours worked by all persons (formerly called man-hours).

PROFITS

........See INCOME

REAL GNP

........U.S. real GNP data are arrived at by dividing components of the seasonally adjusted current-dollars Gross National Product by appropriate price indexes. About 142 product groups are deflated separately each quarter. The quarterly results are adjusted to the annual constant-dollar figures which are prepared in greater detail.

QUITS

........See LABOR TURNOVER

SALES, NET, TOTAL

........Net Sales are the dollar value of machine tool shipments less returns and allowances, including dealers' commissions, if any.

SALES

........are net of returns, allowances, and discounts.

SCHEDULED WEEKLY HOURS

........See HOURS, SCHEDULED, WEEKLY

SECONDARY PRODUCTS

........Products which do not account for the highest proportion of the total shipments of an establishment and are "primary" to another industry.

SEASONALLY ADJUSTED

........Allowances have been made for recurrent seasonal movements. Dividing actual data by seasonal indexes provides seasonally adjusted data.

SEPARATIONS

........See LABOR TURNOVER

SEVERITY OF WORK INJURIES

........See WORK INJURIES

SHIFT DIFFERENTIAL

........Premium paid above straight-time rates for late or night shift.

SHIPMENTS—TOTAL CENSUS

........The U.S. Bureau of the Census publishes data on the value of all machine tool shipments and miscellaneous receipts. This includes the shipments and receipts of the machine tool industry proper (See separate entry—the Machine Tool Industry) as well as the machine tool shipments made by other industries.

Included in these shipments by product class and industry are not only the major classes of products such as boring machines, drilling machines, presses, etc., but also machine tools primarily designed for home workshops, laboratories, etc., parts sold separately, rebuilt machine tools and some tools not specified by kind. Also included are "miscellaneous receipts" of the machine tool industry for such items as contract and commission work, sales of products bought and resold, repair work, etc.

Every five years, the Census of Manufactures collects these data in considerable detail by seven-digit product codes. More than one hundred metal cutting products and about 50 metal forming products are listed, many by quantity and value, in the Census of Manufactures publication on Metalworking Machinery and Equipment for metal cutting and metal forming machine tools (SIC 3541 and 3542).

In years which are not Census years, an Annual Survey of Manufactures is undertaken which permits compilation of product data for five-digit product classes. Data for non-Census years are estimates based upon reports received from a probability sample of all manufacturing establishments.

The Census of Manufactures and Annual Survey data differ from the totals given by the Current Industrial Reports, MQ-35W, and from the NMTBA reports on shipments. The major differences are listed below.

........The Current Industrial Reports, MQ-35W (See separate entry—SHIPMENTS— COMPLETE MACHINE TOOLS—MQ-35W) differ from the Census of Manufactures and Annual Survey primarily because

........1) they do not include machine tools designed primarily for home workshops, garages, etc.,
2) they do not include parts and rebuilt or used machines.

The Current Industrial Reports, MQ-35W differ from NMTBA shipment reports (See separate item—SHIPMENTS—COMPLETE MACHINE TOOLS NMTBA) primarily because NMTBA reports only on shipments of complete machine tools valued at $2,500 or more.

SHIPMENTS—COMPLETE MACHINE TOOL-MQ-35W

........Data on shipments of complete machine tools are collected quarterly by the Bureau of Census jointly with the Business and Defense Services Administration.

The figures are published in the Current Industrial Reports, Series MQ-35W, Metalworking Machinery.

This report differs from the Census products reports in that it excludes

........1) parts and rebuilt or used machine tools;
2) machine tools primarily designed for home workshops, garages, etc.

........Shipments are shown by 5- and 7-digit SIC codes. The classification of products is being developed jointly by government agencies and industry.

The MQ-35W report also includes separate data on numerically controlled machines and on manufacturers' exports.

The value figures represent the manufacturers' selling price, F.O.B. factory, of complete machines as shipped, including all accessories, attachments and numerical controls that are ordered and shipped with the machines. Rebuilt machines, machine tools designed for use in home workshops, laboratories, garages, service shops, or for model making, imported machines, and power-driven hand tools are excluded.

SHIPMENTS—COMPLETE MACHINE TOOLS—NMTBA

........The National Machine Tool Builders' Association publishes a monthly report on orders and shipments for complete machine tools separated into metal cutting and metal forming and further subdivided into "domestic" and "foreign."

The data are collected from participating companies and expanded to industry totals. The totals are periodically adjusted to benchmarks provided by the MQ-35W (See separate entry—SHIPMENTS—COMPLETE MACHINE TOOLS—MQ-35W) for metal cutting and metal forming.

NMTBA data include new machine tools and the accessories, attachments and tools which are ordered and shipped with them. They cover machines built and assembled in the United States.

NMTBA data are published during the month following the report month.

SHIPMENTS—MAJOR USERS AND MAJOR USER CATEGORIES

........The term "shipments" as used in Series M3-1, Manufacturers' Shipments, Inventories, and Orders, U.S. Bureau of the Census, represents manufacturers' receipts, billings, or the value of products shipped, less discounts, returns, and allowances. Shipments for exports as well as those for domestic use are included.

The shipment estimates are adjusted annually to the benchmark levels from the Annual Survey of Manufacturers. (See also MAJOR USERS.)

STOCKHOLDERS' EQUITY

........Assets minus all obligations of the corporation, except those to stockholders. Annual data are average equity for the year (using four end-of-quarter figures). For details, see Federal Trade Commission—Securities and Exchange Commission, Quarterly Financial Report for Manufacturing Corporations.

STRAIGHT-TIME HOURLY EARNINGS

........See EARNINGS

STRUCTURE AND ADDITIONS
........See PLANT AND EQUIPMENT

SUPPLEMENTARY BENEFITS
........See COMPENSATION, SUPPLEMENTARY

TAXES
........See INCOME TAXES

TRANSPORTATION EQUIPMENT
........The Major Group SIC 37, Transportation Equipment, consists of SIC Groups.
........371. Motor Vehicles and Motor Vehicle Equipment
372. Aircraft and Parts
373. Ship and Boat Building and Repairing
374. Railroad Equipment
375. Motorcycles, Bicycles and Parts
376. Guided Missiles and Space Vehicles and Parts
379. Miscellaneous Transportation Equipment

Each major group or industry group consists of the establishments classified according to their major activity.

UNFILLED ORDERS
........See ORDERS, UNFILLED

UNIT LABOR COST
........Unit labor cost is arrived at by dividing compensation per man-hour by output per man-hour.

VACATIONS, PAID
........See COMPENSATION, SUPPLEMENTARY

VALUE ADDED
........Value added by manufacture is derived by subtracting the total cost of materials (including materials, supplies, fuel, electric energy, cost of resales and miscellaneous receipts) from the value of shipments (including resales) and other receipts, and adjusting the resulting amount by the net change in finished products and work-in-process inventories between the beginning and end of the year.

Value added by manufacture avoids the duplication in the value of shipments figure which results from the inclusion of the shipments of establishments producing materials and components along with the shipments of establishments producing finished products.

VALUE, IN FOREIGN COUNTRY
........See IMPORTS INTO THE UNITED STATES

VALUE, AT PORT
........See EXPORTS OF DOMESTIC MERCHANDISE

VALUE OF SHIPMENTS
........See SHIPMENTS

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